CHNOLOGY DEPT.

the OIL AND GAS JOURNAL

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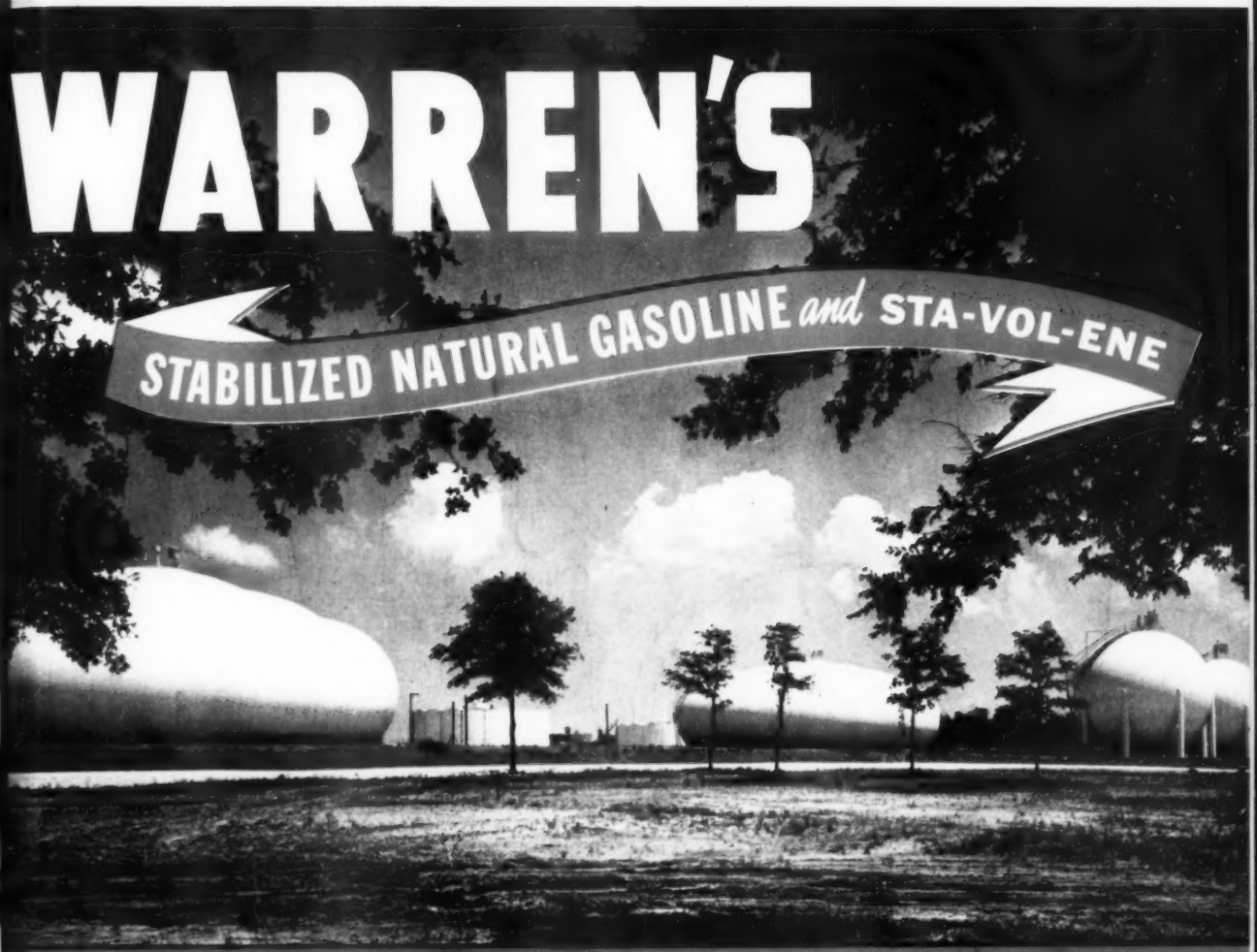
WARREN'S

STABILIZED NATURAL GASOLINE and STA-VOL-ENE



Ready for the Nation's Refiners

WARREN PETROLEUM CORPORATION

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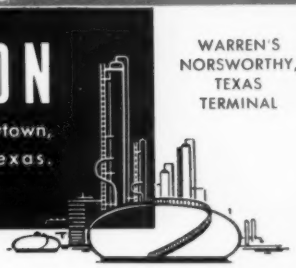


WARREN'S NORSWORTHY, TEXAS TERMINAL

Crude Oil, Natural Gasoline and Liquefied Petroleum Products

PRICE 50 CENTS TABLE OF CONTENTS PAGE 17 AUGUST 3, 1950

XUM

Oil Tank Hit by Lightning

Heavy Hail and Rain, Power Wires Blown Down

An electrical storm, accompanied by heavy hail and rain, caused widespread damage in the St. Louis area, plunged several thousand homes into darkness and snarled rush hour traffic yesterday afternoon.

Manhole covers were displaced by the torrents of water racing through the storm sewers, and many trees were targets of lightning bolts.

Four streetcars were hit by lightning, one each on the Forest Park, Jennings, Park and Hodiamont lines. There were no injuries or damage, but delays ranging from 10 to 28 minutes resulted because the bolts knocked out circuit breakers, stopping the flow of electric power.

Lightning also struck a 130,000-barrel gasoline storage tank at Socony-Vacuum Oil Company, on Twentieth street, between East St. Louis and Monsanto. There was more than [illegible] barrels of gasoline in the tank, but spokesmen said that not more than 200 barrels were lost.

That was because of the tank's "floating lid," he said, which rides on the surface of the gasoline. Only the gasoline exposed to the air, between the edge of the lid and the walls of the tank could burn, and flames were never more than 2 feet high. Fire fighters quickly extinguished these flames with fire-smothering chemicals.

from the
St. Louis Globe-Democrat
April 29, 1950

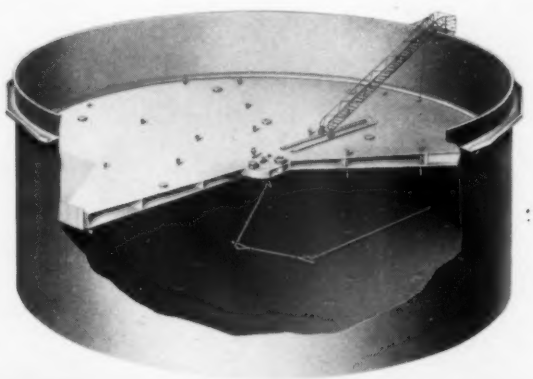
HORTON FLOATING ROOF saves tank from destruction by FIRE!

It can do the same for you!

THE "floating lid" referred to in the accompanying clipping is a Horton Double-Deck Floating Roof. Two important fire protection features were responsible for its superb performance. You can be sure that it will provide the same effective protection for your tanks because these features are an inherent part of every Horton Double-Deck Floating Roof.

First, the cut-away view below shows that, by floating directly on the liquid in the tank, this roof blankets the surface of the liquid. It thereby reduces the fire hazard because it eliminates the air necessary to support combustion.

Second, the Horton seal that is used to close the space between the deck and the tank shell effectively prevents the escape of vapor around the edge of the deck. Therefore, an inflammable mixture of vapor and air will not persist above the roof.



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XUM

Figures can be good friends of yours

They can tell you, for instance, whether your wire rope is giving you a big dollar's worth . . . whether it's a bargain in the true sense of the word.

They can tell you the total amount of work it does in its life, and the cost per unit of work—the only *true* cost. Bethlehem strongly suggests you keep figures on wire-rope performance, so that you will know at all times which brand of rope is doing the best, most economical job for you.

Obviously, we feel that Bethlehem rope will stand out in any such comparisons. We welcome comparisons as a means of proving the basic economy of Bethlehem rope—economy every user can prove with a simple system of records.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

LET YOUR RECORDS TELL YOU!

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950.

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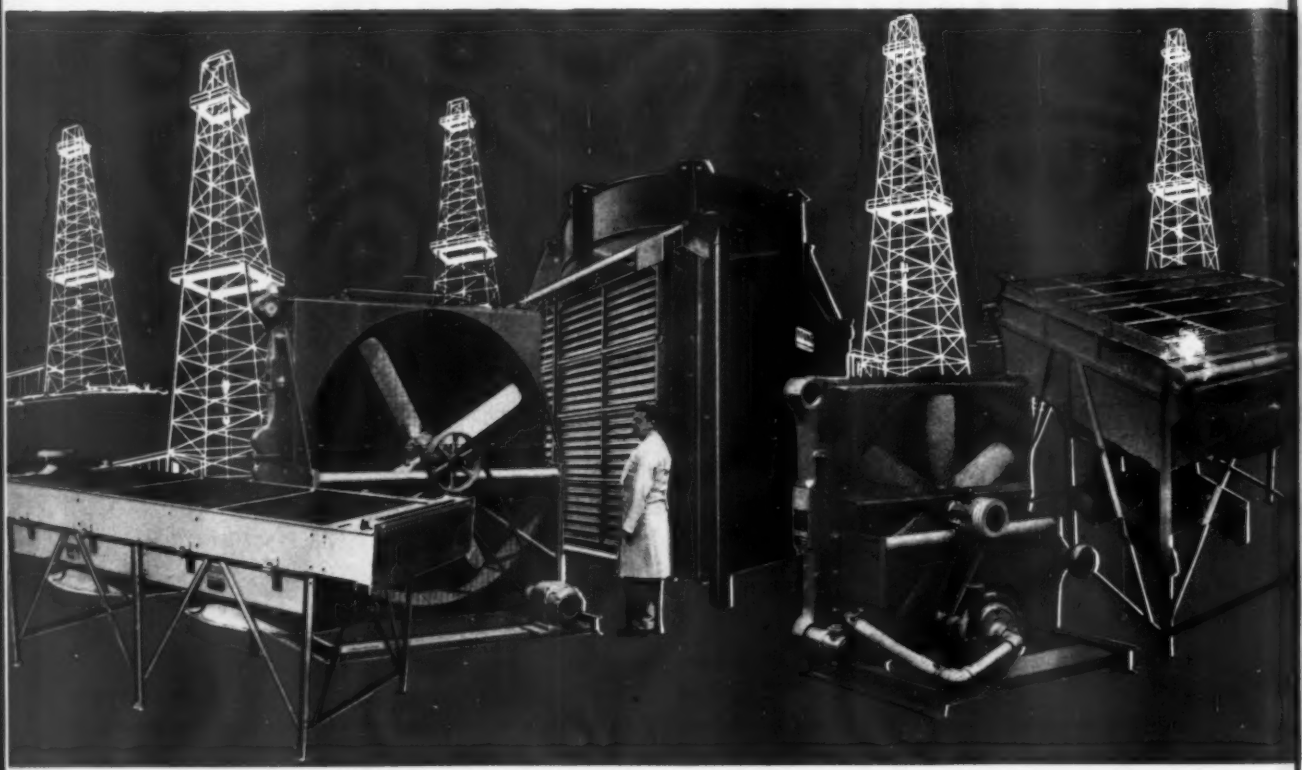
TAILOR-MADE FOR THE PETROLEUM INDUSTRY

The Young Line, from start to finish, is built for your use. Every product is engineered by Heat Transfer Specialists, men with more than two decades actual field experience. Every piece of equipment is manufactured to rigid standards of quality in the Young plants . . . designed for the large-scale production of all types of coil structures. For your convenience, standardized units for routine cooling and condensing are stocked at the plants and field offices.

Young feels its responsibility starts with the specification and continues long after the installation. Nearby trained field experts are available for consultation at any time. Call or write your nearest Young Representative; he will be pleased to give you full details.



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PLANTS AT: RACINE, WIS., and MATTOON, ILL.

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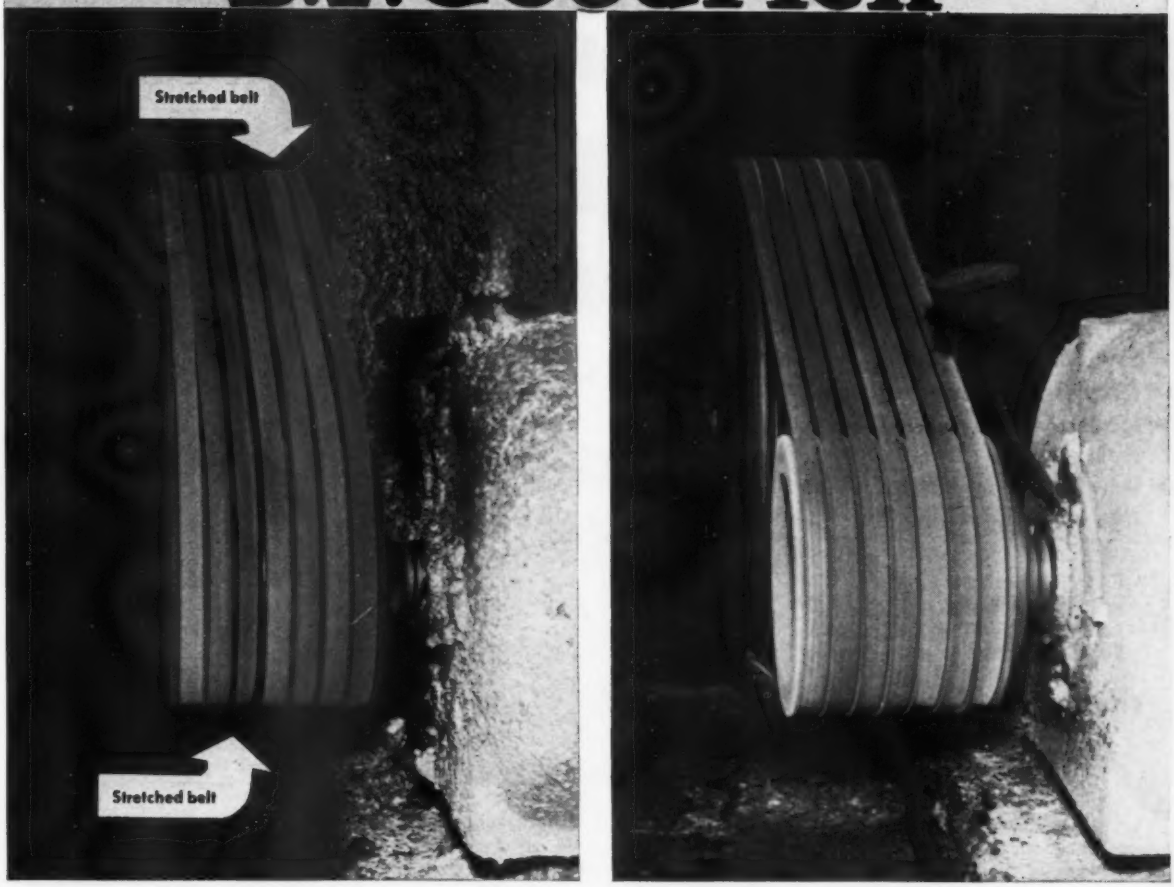
B.F.Goodrich



One of these drives is wasting money — the other has grommet V belts

B.F.Goodrich grommet V belts cut costs 20 to 50%

BOTH of these drives are in the same plant, do the same work, get the same maintenance. When first installed both were equipped with ordinary belts. But within a few days the belts had stretched so much the motor had been moved to the end of the slide rails. Ordinary belts were tried again, but they still stretched, even more so. The photo at *left* shows how the belts looked — loose, permanently stretched, over-riding each other.

Then B.F.Goodrich grommet V belts were put on both drives. After six months of 24-hour-a-day service, they haven't stretched at all, as the photo at right shows. Here are the reasons:

Twin grommets — The B. F. Goodrich grommet is made by winding heavy cord upon itself to form an endless loop. These grommets are placed close to the driving faces of the belt, make up the load-carrying section. No fabric plies to stiffen and build up heat. The B. F. Goodrich grommet V belt is more elastic, has less permanent stretch than any other V belt.

Grommets work all the time — In an ordinary belt much of the cord strength is lost, wasted in the center of the belt where the cords don't pull their share of the load. But in the grommet belt there are no center cords to loaf. The grommets do the work, stay at it all the time.

Grommets last longer — Laboratory and field tests show grommet V belts last 20 to 50% longer. Cause of most belt failures is eliminated by the grommets that replace overlapping cord plies.

The twin grommet construction is a result of B. F. Goodrich research (U. S. Patent No. 2,233,294). No other V belt is a grommet V belt. Presently made in D and E sections only.

A special demonstrator "X-ray" belt has been made to show the grommet construction. Ask your local BFG distributor to bring it around. *The B.F.Goodrich Company, Industrial and General Products Division, Akron, O.*

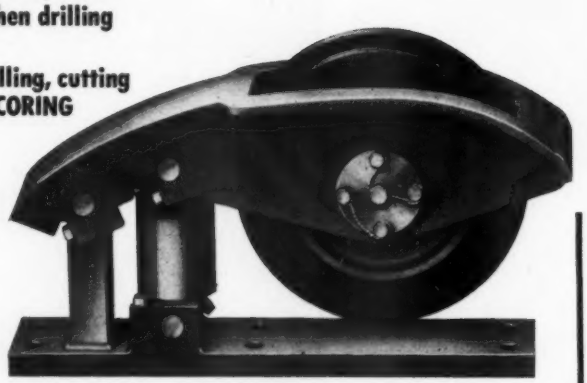
Grommet V Belts BY
B.F.Goodrich

HERE is your STREAMLINED

Martin-Decker HYDRO-MECH TORQUE GAUGE

- Saves chain
- Increases footage on deep wells
- Increases footage when drilling with small bits
- Indispensable for milling, cutting jobs and DIAMOND CORING

for ALL rigs with chain-drive rotaries



The Martin-Decker Hydro-Mech Torque Gauge installed as a rubber-cushioned rotary chain idler provides a remarkably sensitive direct mechanical-hydraulic method of measuring the torque in drill pipe It is a simple instrument, easy to install and easy for the driller to read and understand. The assembly consists of a load-sensitive element — chain idler, load-responsive cylinder high-pressure hose, damper, and 6-inch "rotate-able" dial indicating gauge

The idler is placed beneath the tight side of the chain between the drawworks and the rotary machine It consists of a synthetic rubber-tired wheel mounted on a lever arm which actuates a piston in the pressure transmitter The wheel contacts the under side of the chain, and as the chain raises and lowers under the influence of varying loads, the lever arm moves up or down, decreasing or increasing the pressure in the transmitter After the installation is completed, the roller height is adjusted by pumping fluid into the system with a small hand pump Adding fluid to the cylinder raises the roller, deflects the rotary chain, and increases the pressure in the hydraulic system. The amount of rotary chain deflection depends solely on the point on the indicating dial face which the driller wishes to use for torque reference.

Torque built up in the drill string tends to straighten the deflected rotary chain As torque increases, the rotary chain increases its downward force against the chain idler wheel. The force thus exerted on the wheel develops fluid pressure in the cylinder and that pressure is transmitted through the high-pressure hose to the indicating gauge at the driller's position In this manner, drill pipe torque above or below the established reference point on the gauge is indicated instantly. The dial gauge is mounted either in the Instrument Panel or nearby in easy view of the driller. A high-pressure hydraulic hose with self-sealing coupling connects the cylinder in the load element to the dial gauge

"Rotate-able" Dial Permits Gauge Setting To Indicate Net-Torque-On-Bottom

The gauge is designed with a "rotate-able" dial permitting the driller to zero out friction on drill pipe. thus, the gauge indicates net-torque-on-bit This feature is especially valuable in assisting the driller on wells where friction from any cause tends to absorb weight during drilling operations The torque built up by rotation before weight is applied to the bit is measured by the gauge but is zeroed off by means of rotating the dial to zero, then as weight is applied, the work being done by the bit at the bottom of the hole is instantly reflected by increased readings above the zero reference point on the gauge.

POINTS OF SUPERIORITY

PAYS FOR ITSELF IN A FEW HOURS . . . in time and equipment savings when milling, washing over, running diamond core heads, directional and deep hole drilling.

•

Adaptable to all rigs with chain-drive rotary tables.

•

The torque gauge that operates on diesels.

•

REMARKABLE SENSITIVITY— Responds to very small changes in torque.

•

Can be set for net-torque-on-bottom with "rotate-able" dial adjustable by rotation through 360° — zeros out hole friction, allowing work load at bit only to be measured.

•

Easy to install and easy to adjust to any chain.

•

Easy to move from well to well.

•

Stabilizes the chain and gives longer chain life.

•

Can be furnished for single- or double-link chain.

•

A SIMPLE INSTRUMENT — Easy to read and easy to understand.

•

Minimizes danger of twist-offs.

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

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To get all piping from one source Order it from CRANE

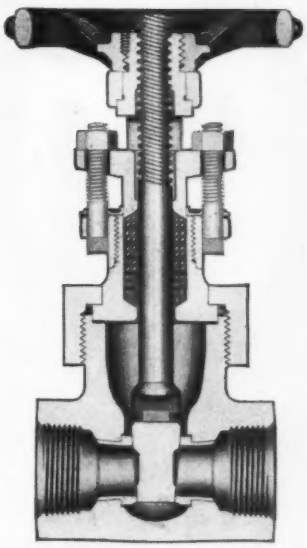
ECONOMICAL SMALL STEEL VALVES FOR OIL AND OIL VAPOR SERVICES

As a matter of fact, these rugged, compact 600-Pound Union Bonnet Gates are an economical buy in more ways than one. First of all, they're moderate in initial cost. And because they are Crane Quality in design, construction and materials . . . routine maintenance costs are negligible.

Stuffing box provides liberal packing space to assure a tight stem seal; male and female bonnet joint is equipped with a soft iron gasket for maximum tightness; body seat rings, securely rolled into place, will not loosen in service.

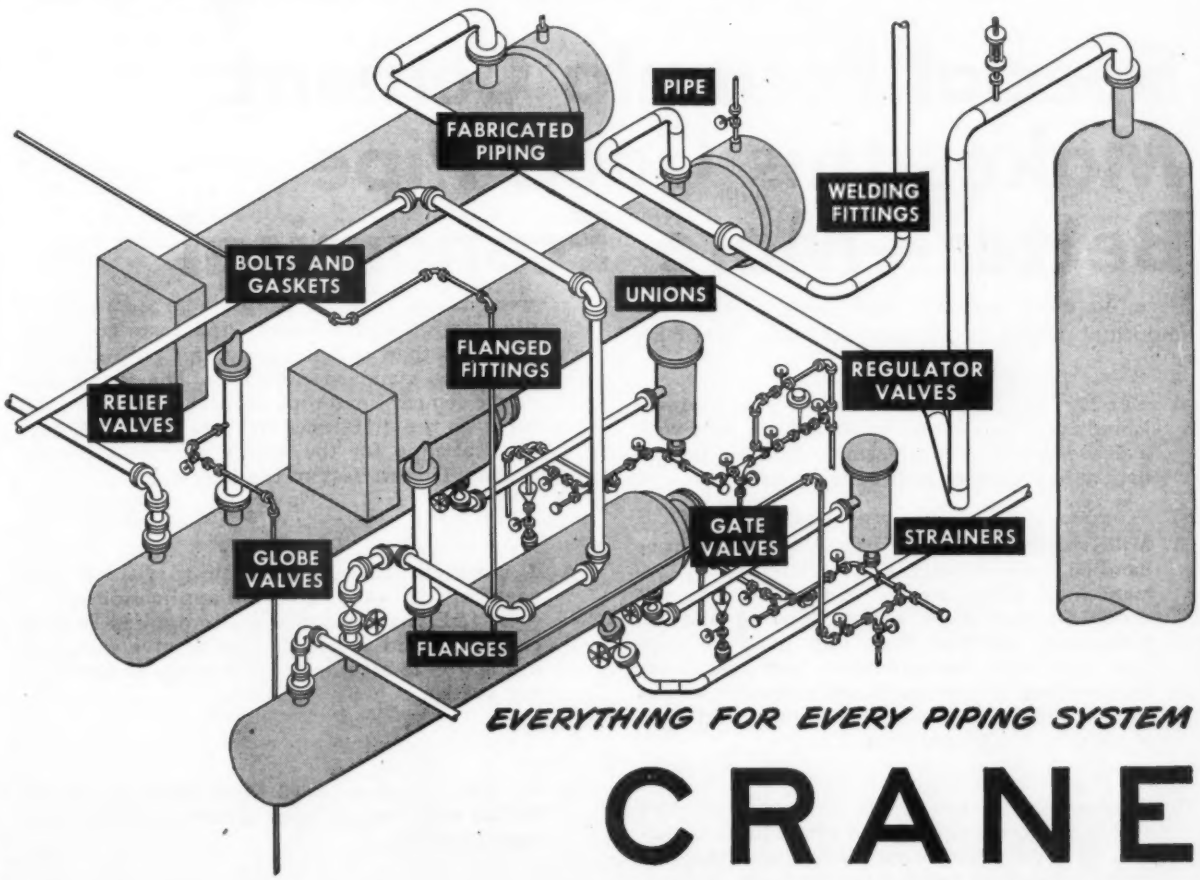
These valves are smooth operators. Guided disc does not get out of line or jam in body. Crane disc-stem connection prevents lateral strain on stem. Accurately cut, easily lubricated stem threads provide positive control with minimum friction. See your No. 49 Crane Catalog.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



No. 3602X, 600-Pound Small Steel Gate for oil or oil vapor up to 1000° F. Exelloy to Exelloy seating. Sizes: ¼ to 2-inch. Screwed or welding ends.

ONE ORDER TO CRANE CAN COMPLETELY EQUIP THIS VAPOR RECOVERY PROCESS PIPING INSTALLATION



EVERYTHING FOR EVERY PIPING SYSTEM

CRANE

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

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Cut Piping with J&L STEEL Cement Lined Steel Pipe

Special Formula Cement Makes this Good Pipe Better—More Economical

Here, in quick question and answer form, are important details on J&L Cement Lined Steel Pipe:

Q. What is cement lined steel pipe?

A. Exactly what the name states. J&L Cement Lined Steel pipe is controlled quality pipe with a dense, hard layer of cement bonded permanently to the inner wall of the pipe.

Q. Where can the oil industry use such a product?

A. Mildly corrosive liquids in any industry can be handled economically and efficiently by cement lined pipe. Specific applications are salt water disposal lines, water flooding and repressuring systems, lines that must be kept free from iron contamination and rust, lines for handling diluted acids and corrosive wastes and hot water lines where ordinary steel pipe is subject to tuberculation.

Q. How corrosive a liquid can be handled?

A. Between the extremes of non-corrosive and highly corrosive there are many liquids classified as mildly corrosive. Many of these are strong enough to require too frequent replacement of standard pipe but do not warrant the tremendous expense of glass or non-ferrous pipe. J&L Cement Lined Pipe costs considerably less than this category and only slightly more than standard steel pipe. The longer life of the cement lined pipe enables it to more than make up the difference in cost. It is *THE* economical pipe for the mildly corrosive liquids because it costs less in the long run.

Q. Although the cement protects the pipe, how about fittings and couplings?

A. A complete line of cement lined fittings and couplings is available for all applications. Further, J&L has developed easily applied sealing compound and Liquid Binder to give complete protection to all joints and fittings in any piping system.

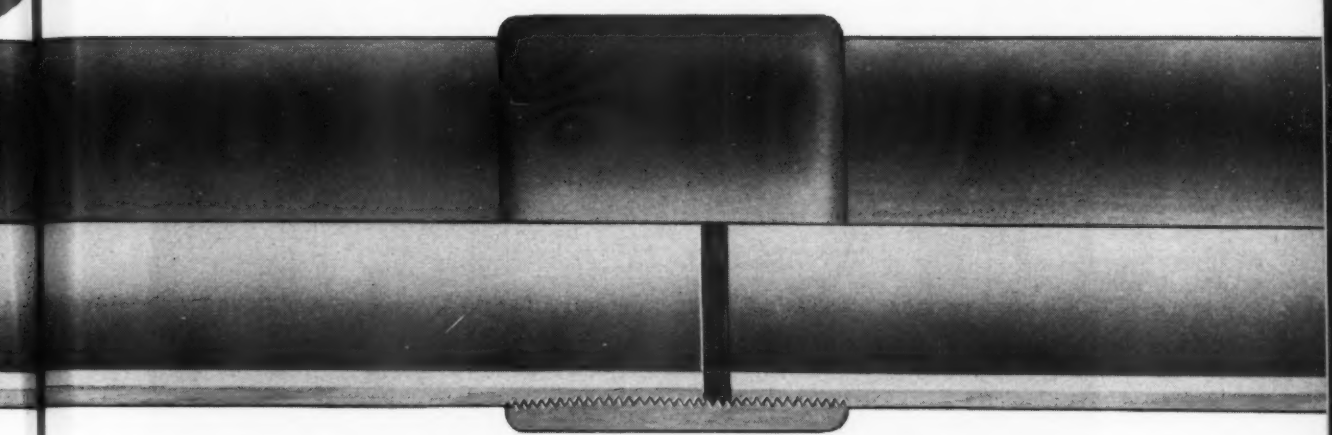
Q. Is special equipment or special trained personnel necessary?

A. No. J&L Cement Lined Steel Pipe can be installed with regular pipe fitters working with regular tools.

Q. Can the pipe be dismantled and reassembled?

A. Yes. The pipe can be taken down and relaid

Costs !



with little more than the usual care required in handling ordinary steel pipe. It is flexible enough to follow ground contours without cracking the lining.

Q. How about vibration, high temperature and pressures?

A. The cement is of special formula that enables it to withstand vibration without cracks or breaks. Temperature effects little change in the pipe as the cement and steel have approximately the same coefficient of expansion. Witness innumerable steel and concrete buildings. The cement lined pipe will handle pressures as high as unlined pipe of the same size.

Q. What about turbulence?

A. The cement lining in J&L Cement Lined Pipe is satin-smooth. Its friction coefficient is lower than for unlined pipe. Actually, cement lined pipe has greater carrying capacity than ordinary pipe of the same ID. Also the cement of J&L pipe is highly insoluble and absorption resistant. It keeps its smooth interior and low friction coefficient over a long period of time.

★ ★ ★ ★ ★ ★

Should you have any further questions regarding J&L Cement Lined Pipe, see your nearby Jones & Laughlin Supply store or write to us in Tulsa.

79 stores for your convenience!

"... here's MY warehouse!"

Jones & Laughlin Supply Company

Subsidiary of Jones & Laughlin Steel Corporation

TULSA, OKLAHOMA

J&L STEEL

XUM

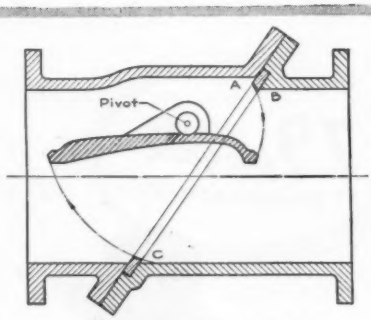
For Quick, Quiet Closing...

USE CHAPMAN *Tilting Disc* CHECK VALVES

You get truly cushioned closing with these tilting-disc check valves. There's no slamming. Instead, the disc rides smoothly on the flow, opens easily, closes quickly and quietly. Because of this effortless action, power costs are lower (when used on pump discharge lines) . . . maintenance costs are lower . . . operating expenses are saved in a dozen ways.

Available in either iron or steel. Write for bulletin with complete information.

The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASS.



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

XUM

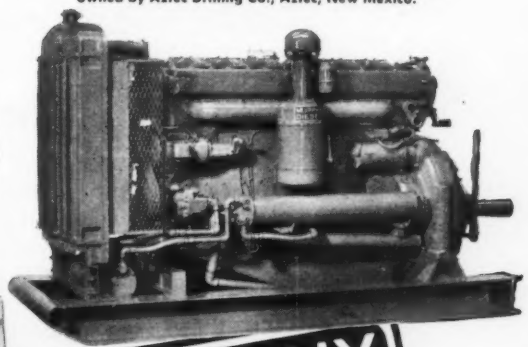
Drill more wells, faster

with MURPHY DIESEL POWER

DEPENDABLE heavy duty Murphy Diesel Power is the kind of power that stays on the job longer with less downtime, to give you more horsepower hours of drilling every tour. "True" diesel operation, unit fuel injection, four valves per cylinder and extra heavy crankshafts and bearings are just a few of the many reasons why Murphy Diesels are able to deliver this kind of power. The booklet *"10 Questions to Ask a Diesel Engine Salesman"* gives more of the details. Ask your Murphy Diesel Dealer for a copy or write direct.

MURPHY DIESEL COMPANY
5305 West Burnham St., Milwaukee 14, Wisconsin

Illustrated is a Unit 15 rig powered by three 150 H.P. Murphy Diesels which also supply power for the mud pump. The rig is in use at Lindrith, New Mexico, drilling gas wells. This is one of two Murphy powered rigs owned by Aztec Drilling Co., Aztec, New Mexico.



MURPHY DIESEL

See Your Murphy Diesel Dealer

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DALLAS, TEXAS
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OIL INDUSTRY FACTORY BRANCH — *Sales, Parts and Service:*
113-117 South Elwood Street, Tulsa, Oklahoma

Heavy duty power
for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 220 H.P. Generator Sets 60 to 133 K.W.

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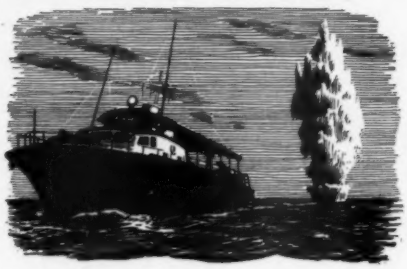
How jobs were created

How hundreds of businesses were helped

How a new source of oil was tapped



The story behind deepwater oil

A few years ago, a test well proved there is oil under the great Continental Shelf that extends out into the Gulf of Mexico, and although the well did not produce much, it started one of the most unusual—and expensive—drilling programs in history.

So far, in the search for underwater oil, seven drilling platforms have been built, similar to the one above, as far as 10 miles offshore and in water as much as 65 feet deep. They are set on tubular steel pilings driven 250 feet through the ocean's bottom, for they must be strong enough to withstand Gulf hurricanes.

The story behind this operation is the story of risk... and of determination to do everything possible to find oil for the growing needs of motorists, farms and industries. Each underwater field costs millions of dollars more than any of equal size drilled on land, and although oil has been found, not enough has been produced yet to repay more than a small fraction of the costs.

Meanwhile, the money being risked is creating many jobs, spreading to hundreds of large and small businesses . . . and helping to keep our economy free, competitive and strong.

STANDARD OIL COMPANY
OF CALIFORNIA
plans ahead to serve you better

XUM

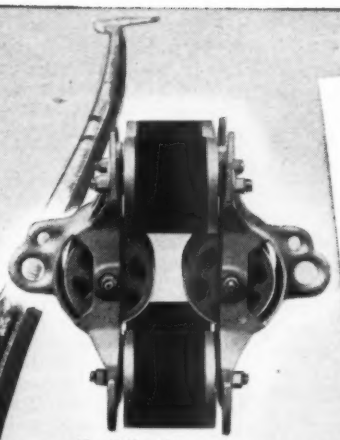
XUM

Always Specify Thermoid as your first choice

The top quality of Powerflex Rotary Hose—everywhere recognized as first choice—is typical of the *entire family* of Thermoid Oil Field Products.

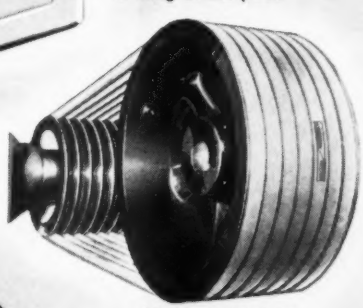
You won't go wrong when you specify Thermoid Quality Products. They are "built for the job", assuring you of dependability under all drilling conditions.

For long service life and low operating cost, it will pay you to *Specify* Thermoid!



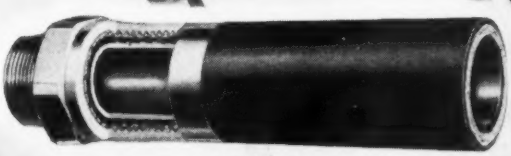
No-Wip Line Saver
Beats the danger and expense of excessive line wear.

Wire Line Turn Backs
Spooling troubles become a thing of the past.

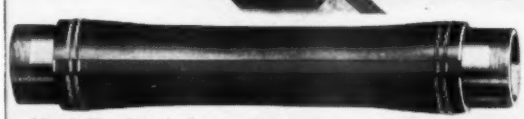


Multiple V-Belts
Specially impregnated to assure longer life under roughest operating conditions.

Flexible Discharge Units
Built to same rugged specifications as Powerflex Rotary Hose.



Blowout Preventer Hose
Can handle *any* pressure met in blowout preventer equipment. Special high pressure couplings.



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They Say—

Fuel-Tax Evasion

"Motor fuel tax collections now exceed a billion and a half dollars a year. Since the automobile came into general use and the first state tax was levied in 1919, the petroleum industry collected and remitted in motor fuel taxes to the states about 25 billions of dollars. This is a lot of money and it offers a great temptation to criminals.

"All of the factors that lend themselves to tax evasion are present today. There is an abundance of petroleum products, and distribution is highly competitive. Surpluses and occasional quantities of distress material, seeking markets at subnormal prices, furnish a background for potential illegal operations.

"Increased use of motor vehicles and the consequent increased volume of taxable motor fuel has placed heavier burdens on the Motor Fuel Tax Administrators and their staffs. Since 1941, there has been an increase of 60 per cent in the number of farm tractors. There are now approximately 44 million registered motor vehicles in the United States, of which 36 million are passenger cars. This huge transport system will use about 35 billion gallons of gasoline and oil this year."

Frank V. Martinek, chairman, Central Gasoline Tax Evasion Committee, addressing annual conference, Northwest Central States Gasoline Tax Administrators, Cheyenne, Wyo.

Problem by Scurry

"Natural-gas handling offers many intriguing problems. Lone Star Gas Co., which will handle the gas from the Scurry County field in the middle of West Texas, is apparently stuck with a not-too-common problem. Besides being one of the most sensational oil finds in two decades, Scurry has another distinction—its gas, high in C_4+ hydrocarbons, is relatively free of carbon dioxide and hydrogen sulfide. Even after processing in the stripping plant under construction by owners of the field its heat value will be 1,400 to 1,500 B.t.u., compared with the slightly more than 1,000 B.t.u. of general run natural gas for domestic use, for which burners and orifices have been set. Equipment costs for stripping down to this latter value would be unreasonable and the light petroleum gas products would be entering an already glutted market at a considerable transportation disadvantage. With no low-B.t.u. manufactured gas in its distribution area, for diluting as practiced in the North and East, Lone Star is "scurrying" around for a suitable diluent."

Chemical and Engineering News.

Optimistic View

"It seems safe to predict that the economy could handle an increase in defense spending to $20 billion without regimentation. With great good sense on the part of government and business management, a military expansion to the level of $25 billion might even be absorbed into an essentially free and civilian economy."

Fortune magazine.

Time to Watch

"Proposals of control of the American economy are beginning to appear. Probably there will be a number of them. Congressional wisdom will be needed to draw the distinction between measures which would genuinely further defense preparations and those of the kind that would provide control machinery which would serve no useful purpose, and in fact would be genuinely harmful.

"It has always been oddly contradictory that while we attribute our ability to produce and create in far greater measure than any other country to freedom of opportunity and the

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competitive system, there are some who at the first indication of emergency or danger begin suggesting the appointment of a 'czar' or a number of czars."

Russell B. Brown, general counsel, in a report to J. Ed Warren, president, Independent Petroleum Association of America.

Price Cutting

"A recent opinion survey showed that about half the population held the amazing misconception that prices of petroleum products are set, even today, by collusion among the oil companies. There are perhaps three reasons for that misconception. One is the frequent repetition of such charges by demagogues and by others unfriendly to free enterprise. A second is that, in a truly competitive market, prices on products of similar quality inescapably tend to be similar, and to meet changes either up or down, with little delay. A third reason may be the disparaging way in which we competitors habitually refer to 'price-cutters' as though they were violating some gentleman's agreement. This attitude is understandable, because established marketers naturally dislike to see prices or margins reduced. Those who start reductions are generally those who, due to lack of acceptance, find they cannot otherwise penetrate a market or expand their sales to the extent desired.

"However, I doubt if there is any company in our business that has not frequently cut prices in one way or another. Price-cutting is one way in which the public reaps the benefits of progress in the reduction of the costs of making and distributing products. Its prevalence in America marks the essential difference between our free competitive enterprise and the European cartelization practices that have proven so inimical to progress. Despite their dislike of price-cutting, business men have long since learned that agreements to maintain prices are not only illegal and contrary to sound public policy, but are unenforceable and ineffective, as they proved to be so early in NRA history."

Robert E. Wilson, chairman of the board, Standard Oil Co. (Ind.), in a booklet distributed by the National Petroleum Association.

Industry's Message

"The record of the petroleum industry—past and present—is a story of public service through sound organization and vigorous competition. The future of our industry lies in more efficient organization and the preservation of the right to compete in a free market.

"The industry encompasses all of the elements to assure an advancing world civilization that adequate petroleum supplies, at the lowest possible cost, may be relied upon for any and all foreseeable requirements. Such industrial assurances have little validity unless there are equal assurances of the right of our citizens at home and our nationals abroad to compete freely in the markets of the world on nondiscriminatory terms.

"Essential to the public welfare is freedom of competition within the petroleum industry, and between competing industries, for the available fuel markets. Consumers are entitled to all the advantages and conveniences which result from legitimate competition; but the public can enjoy these only to the extent that equal opportunity for all to compete in a free market is preserved.

"The American Petroleum Institute is pledged to a program of carrying the industry's message to the people. Oil men are of the opinion that an informed public—a public to which the facts are presented accurately and truthfully—is the best insurance that the opportunity to render the widest public service will be maintained not only for the petroleum industry, but for all industry."

Frank M. Porter, president, American Petroleum Institute.

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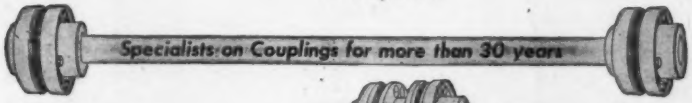

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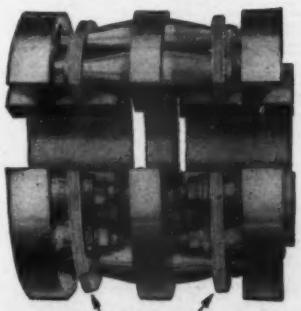

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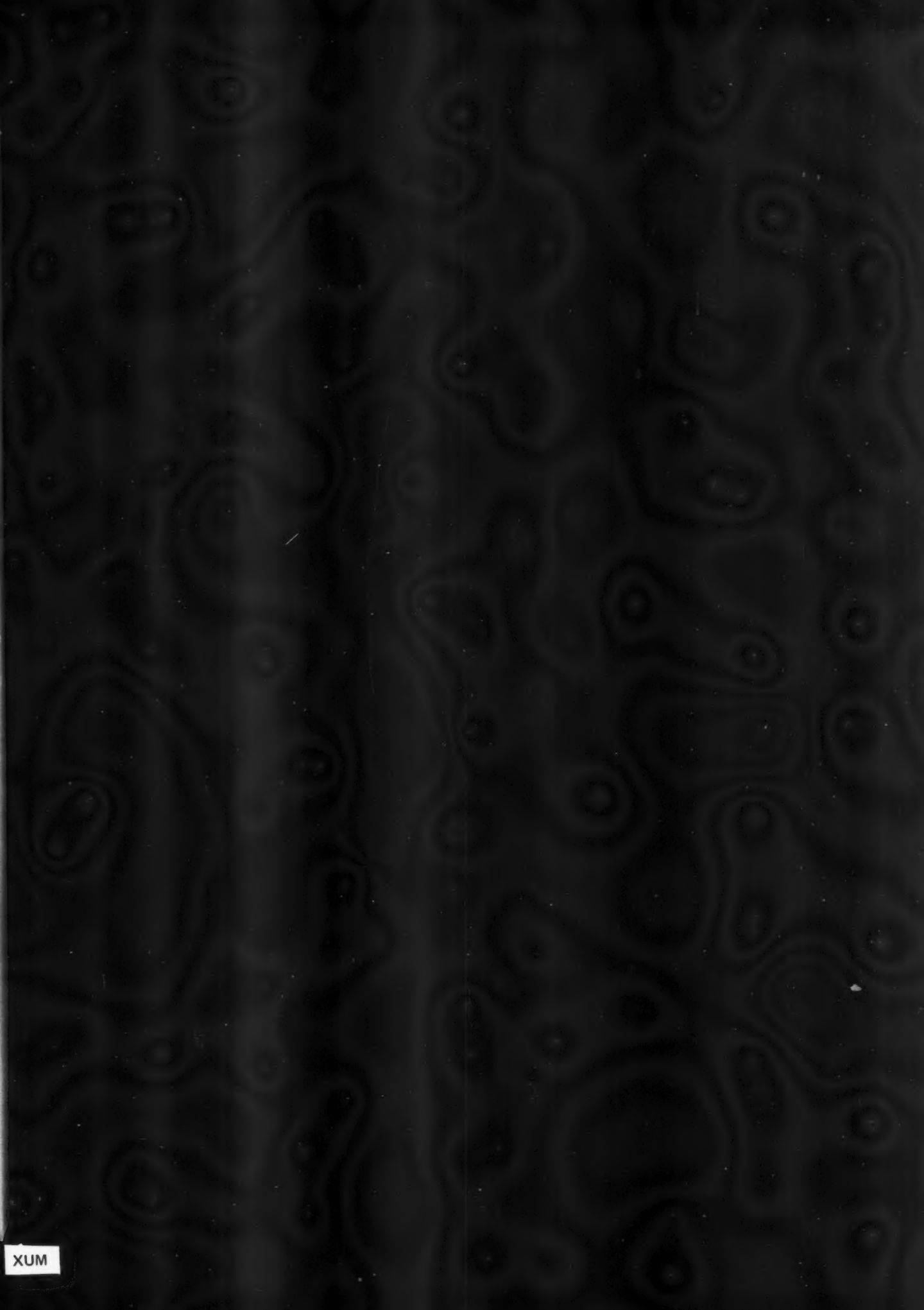
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JOURNALLY Speaking

Orchids to Kansas

HERE'S news that's newsier than man bites dog: Government agency reduces costs and fees.

It happened in Kansas, in the Conservation Division of the Corporation Commission. And right in this year of 1950 A.D. (A.D. standing for Added Deficits). The division has ordered a reduction of 25 per cent in the assessments made against oil and gas production to finance its own operations. To cap it off, the commission explained its action with this astounding statement:

"The commission is firmly of the opinion that wherever economies in the cost of government can be obtained, any reduction in such costs should be made available to those individuals or companies who are assessed to provide the funds to pay the cost of administration."

That attitude is just about heresy in bureaucratic circles. It might put ideas in the heads of taxpayers. Theo Morgan and his associates in the Sunflower State are liable to censure for this deviation from the bureaucratic party line. However, we doubt that this little Kansas rebellion will spread to Washington.

It's a Gift

THE Journal's offices recently were honored by a visit from a real, live forked-stick oil finder. We had thought that witching for oil was a lost art, but this man is very active, and left us one of his business cards.

He is a retired job printer from Springfield, Mass., and has been locating water wells for the past 20 years but only recently has he turned his talents to the oil business. He is very sincere, but very modest. What he has, he says, is just a gift, like some people can play the piano. He uses metal (iron, steel, or copper), or wood. Eucalyptus or poplar gives the best results. (The old timers, we believe, preferred peach or willow).

Equipped with a proper wand, he says, he can actually feel oil, and offered to locate a buried oil can blindfolded. Recently he took a boat trip across Long Island Sound from New London, Conn., to Sag Harbor, L. I., and felt all kinds of oil. (Note to Department of Justice: File tidelands suit against New York and Connecticut).

In an attempt to cash in on his unique gift he sunk his lifetime savings in a well he located near Wellsville, N. Y., but the driller lost the tools at 5,025 ft. Unable to afford a fishing job, he is now attempting to replenish his capital by serving as a consultant to more fortunate oil operators.

He says he has traveled over the country and has felt oil in a number of areas which have never been suspected or drilled, particularly in Texas, New Mexico, and Southern California. He also says he can pick up pipe lines with no trouble at all.

The existence of such talents make the oil industry look a bit foolish for spending so many millions of dollars on geological, geophysical, and seismic work. However, most of us aren't sufficiently gifted to play the piano so if we want music we have to buy a radio or phonograph, and it's the same way with finding oil.

Too Many T's

FOR the benefit of headline writers, as well as the general public, there ought to be a committee on nomenclature of gas pipe-line companies. There's so much similarity in the names that it's hard to keep them straight.

For instance, the initials T.G.T. fit fine in a headline, but might stand for either Tennessee Gas Transmission Corp. or Texas Gas Transmission Co. To add to the confusion, Texas Gas is headquartered in Kentucky, and Tennessee Gas is headquartered in Texas. Then there's Texas Eastern Transmission Corp. and Texas Illinois Natural Gas Pipe Line Co., and, still under the T's, Transcontinental Gas Pipe Line Corp. which also is operated out of Texas.

Hope that the next big line gets christened with some short and original cognomen that's so distinctive it can't possibly get confused with any other.

—*Henry D. Ralph.*

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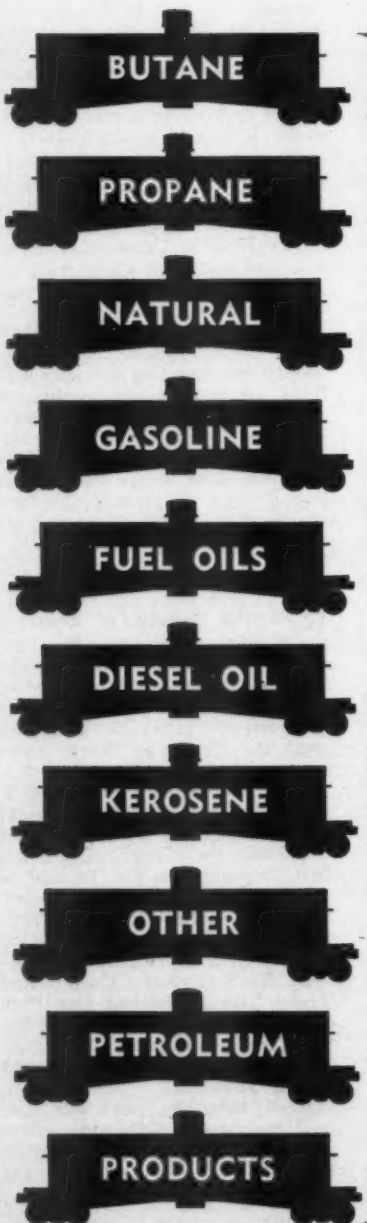
call anchor first . . .



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DO YOU KNOW HOW "Metal Petals" BRING YOU SUCCESSFUL CEMENTING RESULTS?

In any cementing where a lower zone must be protected from contamination by the cement slurry (as well as from sloughings or cavings) the Baker METAL PETAL Basket will be found both safe and successful.

The unit is constructed of a number of individual "petals" made of flexible sheet metal. These petals are mounted on reinforcing spring steel ribs, which in turn are mounted on a ring to form the Basket.

When running in the hole, the upward pressure of the fluid tends to close the "petals" thus providing fluid passageway between the Basket and the walls of the hole, without distortion of the Basket. As soon as the casing comes to rest, upward pressure by the fluid is relieved and the petals expand to contact the walls of the hole. Any tendency of fluid to move downward then presses the flexible petals more firmly against the entire circumference of the hole. Solids strained from the fluid tend to build a bridge inside the Basket which is thus converted into a one-way packer of great strength and effectiveness.

SIMPLE, EFFECTIVE ACTION

The "Metal Petals" not only expand to contact the entire circumference of large diameter holes, but also pack-off in holes of irregular shape; and the independent action of the individually mounted overlapping petals permits successful use of the Basket in casing programs with minimum clearances.

All-metal construction and design provide ample strength; lessen the possibility of splitting or otherwise damaging the Basket while it is being run in; and the metals are unaffected by usual acids employed for various purposes.

MOUNTINGS TO MEET ALL NEEDS

Baker Metal Petal Baskets are furnished mounted on plain or perforated nipples; with or without different types of Baker Whirler Float Collars; for a wide range of cementing applications. When conditions permit, it is recommended that Baker Metal Petal Baskets be "slidably" mounted to allow rotation, spudding, or reciprocation of the casing without distorting or damaging the Basket. Maximum efficiency of Baskets is assured when a Baker Model "G" Casing Centralizer is used immediately below the Basket assembly. For details see the Baker (or Composite) Catalog; or ask any Baker representative for specific recommendations.

TOP, Baker Metal Petal Basket (Product No. 340) ready for assembly into any required cementing hook-up. The strong, spring steel ribs, each with a "metal petal" attached, expand against the wall of the hole to form a safe "one-way" packer which prevents downward movement of the cement slurry.

LOWER VIEW illustrates the overlapping "petals" (each mounted on its individual spring steel rib) thus providing flexibility and freedom of expansion to pack-off around the circumference of large-diameter holes, or holes of irregular contours. A Baker Model "G" Casing Centralizer mounted just below the Basket is recommended.

LEFT, a popular hook-up consisting of a Baker Metal Petal Basket mounted on nipple, with a Baker Cement Whirler Float Collar with Solid Baffle (Product No. 305) which causes the cement slurry to pass through the baffled, side-whirler ports.

RIGHT. Where the casing is to be rotated or reciprocated while cementing, the Metal Petal Basket is "slidably" mounted between two Stop Rings. This permits free rotation, and ample vertical movement of the casing, without distorting or damaging the Basket.

HERE'S AN EXAMPLE OF STRENGTH

The Baker Metal Petal Basket holds a record for keeping cement ABOVE and OUT OF a "zone" possessing *lower formation pressure* and *higher permeability* than is likely to be encountered in any oil well. The "zone" was an *open* coal mine stope (lateral) through which a 16-inch hole had been drilled. A Baker Metal Petal Basket, mounted on 10¾" casing (used as the surface string) successfully supported a 640-foot column of cement slurry above the stope, without breakdown or leakage. This example not only demonstrates the bridging ability of the Basket assembly, but also is evidence of the tremendous structural strength which it possesses.

BAKER
METAL PETAL BASKET
PRODUCT NO. 340

BAKER OIL TOOLS, INC.
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Walk, Don't Run

In contemplating the possibility of a war the natural inclination is to think in terms of the last war. During World War II the oil industry had difficulty getting enough steel. So when it appeared that we were on the verge of World War III many oil operators rushed to order steel to cover all possible needs for a year or more in advance.

So did other industries using steel. As a result the mills were swamped. They wisely closed their books to await instructions from the Government. Those instructions are now in process of being formulated.

Some sort of steel allocation is inevitable, the degree depending on international developments. But at present the administration is not planning to put the nation on an all-out war footing during the next several months. Therefore there is no reason to assume that the oil industry's steel problems will be the same as during the height of the last conflict.

The present plan is to allocate basic steel at the mills for the most essential uses and to let the industries work out the division among end products. One thing could hasten the imposition of stricter controls, and that is a wave of scare buying, hoarding, and gray-market diversion. Buyers should realize that if and when all-out controls are imposed they will include inventory ceilings, detailed determination of use, and recapture of hoarded stocks. So frenzied advance ordering for projects not yet on the drawing boards defeats its purpose and brings strict regulation that much closer.

Since the Korean crisis developed, the Government and the oil industry have moved quickly but calmly to prepare for any eventuality. The National Petroleum Council already has committees at work on several phases of the steel and related problems. They are authorized to speak for the industry.

In this preliminary planning at least two mistakes of the last war are being avoided. There is now a realization of the importance of oil and the need for steel to get it. There is also set up and functioning the government-industry machinery for ascertaining oil's need for steel, for speaking for it forcefully, and for apportioning the allocation.

Most of the men on the various industry committees performed similar functions in World War II and they showed their realism and fortitude in doing the oil-war job regardless of the impact on individual companies. The industry can have confidence in their ability to do it again.

Now is the time for calm planning rather than a blind scramble for individual advantage. Operators in every branch of the oil and gas industry should attempt to map out what may be required under various stages of mobilization and the equipment and manpower needed for those tasks. These tentative plans or schedules may then be submitted to the committees which speak for the entire industry.

The teamwork which got the industry through the last war can, if sanely and promptly utilized, serve well in the present emergency.

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THIS WEEK

MOBILIZATION—All-out industrial mobilization considered by Congress as alternative to administration plan of partial controls. . . . Government agencies scramble for power as plans progress to channel materials, manpower to essential industries. . . . No definite pattern of controls has emerged as yet. . . . Possible bottlenecks in petroleum industry being surveyed. . . .

PREPAREDNESS—National Petroleum Council moving rapidly to survey industry's position in defense program. . . . Committees at work on steel needs, military products, storage facilities, similar problems. . . . ¶NPC and OGD slated to be channels for handling mobilization problems and war planning of petroleum industry. . . . ¶Steel situation still pretty much frozen following first rush for advance orders. . . . Mills awaiting government instructions. . . .

INTERNATIONAL—Shell adding modern lube-oil plant to its Punta Cardon refinery. . . . First in Venezuela. . . . ¶Pauley and Sharples interests plan to start work soon under their new drilling contracts in Mexico. . . . Terms are similar to those of Pemex-CIMA agreement. . . . ¶France appears to have its second oil field in Lacq, near Pyrenees. . . . Second well indicates fair-sized structure. . . .

ACTIVITY—Crude production for week ended July 22 averaged 5,448,600 bbl. daily, down 7,125 bbl. daily from previous week but up 775,200 bbl. daily from same week last year. . . . ¶Well completions for the week totaled 907 compared with 917 for previous week and 800 for same week in 1949. . . . Wildcat completions decreased to 163 wells from 178 previous week. . . . ¶Rotary rigs operating in United States on July 24 increased to 2,217 rigs from 2,167 a week earlier. . . .

TRENDS—Factory sales of motor vehicles for domestic market totaled 3,615,451 in first half of 1950, an increase of 27.7 per cent over first half of 1949. . . . ¶Indicated demand for refinery gasoline for 4 weeks ended July 22 was 7.8 per cent greater than same period last year. . . . High gasoline demands are expected to keep gasoline stocks below last year's level. . . .

OCTANES—Survey shows octane ratings of motor fuel this summer highest on record and climbing rapidly. . . . But a decline may start. . . . ¶Alkylate at present is only serious bottleneck in supplying military petroleum products. . . . It may be diverted to aviation gasoline, causing some drop in quality of civilian motor fuel. . . .

CRUDE—Oklahoma and Louisiana raise crude allowables in anticipation of heavy demand. . . . ¶California's production climbing, aided by reopening of shut-in heavy crude. . . . Higher prices for low-gravity crude and residual fuel oil stimulate output. . . . ¶Interstate Oil Compact Commission calls on all states for reports on their maximum ability to increase crude production. . . .

NATURAL GAS—Pacific Coast Gas Association told high-B.t.u. gas from residual oil can ease problems of converting to natural gas in the Northwest. . . . ¶Colorado Interstate Gas Co. and Canadian River Gas Co. authorized to construct pipe-line facilities which will carry additional natural gas to the Rocky Mountain area.

REFINING—Socony-Vacuum Oil Co., Inc., lets contract to C. F. Braun Co. for T.C.C. unit at East Chicago, Ind., refinery. . . . Eight are now being built in the industry. . . . ¶The Texas Co. and Oil Workers International Union local at Port Arthur, Tex., call truce in 3-month-old strike at Texaco refinery. . . .

***UNDER PRESSURE.**—Refineries normally operate around the clock, but this striking night view of Shell Oil Co.'s Wood River refinery is suggestive of the pressure which may be put on the refining industry to meet military demands if international situation continues to worsen.*

Mobilization Planning

Congress drafts control powers while executive agencies study manpower and materials capacity for another war

Bertram F. Linz

WASHINGTON.—Administration officials asked congressional committees last week to speed enactment of legislation effectuating President Truman's request for priorities and allocation authority, inventory control, and regulation of credit and speculation in commodities.

They supported the President's statement that these measures will be adequate to meet the immediate needs of the Korean situation, but other witnesses before the committees, including Bernard Baruch, urged across-the-board regulation of the whole economy.

The general sentiment in Congress at the moment appears to be for limitation of control to the minimum necessary to support military expansion as now outlined, and present plans of congressional leaders contemplate only the enactment of what the President has asked, to be followed by adjournment or recess.

Meanwhile, the various government agencies have been pushing studies to determine what is needed to put the country on a war footing and have found that there are many material shortages and bottlenecks. One of them, it was disclosed to the National Petroleum Council last week, is alkylate for aviation gasoline. These shortages and bottlenecks, which would have been of negligible importance in the pre-Korea economy, now threaten to become real problems.

Shortages.—As the oil industry already knows, steel supplies were tight even before the Communists invaded South Korea. But there are shortages in other basic materials, including some chemicals, and steps already have been taken to increase the output of synthetic rubber.

In some commodities the country is in less favorable position to increase production than it was at the outbreak of the last war. The steel industry, for example, was operating at only 82 per cent of capacity in 1940 but this year has been running at close to par with much greater total capacity.

The oil industry, also, is in a less favorable position percentagewise. We had a surplus productive capacity of 1,000,000 bbl. a day at the outbreak of the last war and in June of this year had about the same, but in the meantime production and demand have increased enormously.

In the field of manpower, we had 8,000,000 workers unemployed in 1940; today the figure is around 3,500,000. Percentagewise, again, the showing is even less favorable because of the much higher employment now over a decade ago. Recruitment of labor for the $30,000,000,000 military budget which now appears probable would create many problems and necessitate the shifting of large numbers of workers out of civilian activities.

Given proper direction from Washington, some steps can be taken to overcome present deficiencies. The military services have not yet completed their production schedules and it may be some time before defense orders begin to go out in volume. There is little that can be done to increase the production of steel until plants now building are completed. Steel industry reports indicate that over 6,000,000 ingot tons will be added to capacity by the end of 1952. But if there is enough time, raw material and plant capacity can be increased in many lines, the exact extent depending on the administration of allocations.

Skilled men.—In a move to build up a reservoir of scientific knowledge which can be drawn upon in the event of war, the Office of Education, by agreement with the National Security Resources Board, has undertaken the establishment of a national roster of scientific personnel and will conduct inventories and make studies of the country's scientific manpower supply.

The register will record and evaluate the competencies of the nation's specially trained and highly skilled personnel in important scientific fields, and report on the character and distribution of the supply of manpower in the various scientific fields and consider steps which might be taken to increase the number of highly skilled personnel in shortage areas.

This register will be in addition to listings already set up in various agencies of industrial executives and experts who may be called to Washington to man emergency agencies. Such lists have been prepared in the Oil and Gas Division and the Munitions Board, among other agencies, the former containing the names of men who could be called to serve on any new version of the Petroleum Administration for War that may become necessary.

Deferments.—The United States Employment Service also got into the picture last week, undertaking spot checks for the Defense Department to learn what effect the calling of reservists and national guardsmen will have on production. At the same time, USES offices throughout the country are canvassing manufacturers to determine what manpower demands will develop when the military production program gets under way.

Meanwhile, military officials are working on the problem of deferments and are expected momentarily to announce a definite policy. The broad program, immediately affecting reservists called to duty involuntarily, is being drawn up by the department's personnel-policy board.

Officials warned that few deferments should be expected among men in reserve and national-guard units, since membership in those organizations assumes availability, but it was acknowledged that it will be necessary to relieve men from military service who are considered to be more essential to vital industries.

Monopoly Charged

Government cites Standard-Atlas for trade practices

WASHINGTON.—The Federal Trade Commission last week charged five Standard Oil companies and Atlas Supply Co. with monopolistic practices in the purchase and resale of tires, batteries, and other TBA products in alleged violation of the Federal Trade Commission and Clayton Acts.

The Standard companies named were those of Ohio, Kentucky, California, Indiana, and New Jersey, which own all of the common stock of Atlas in equal amounts. Atlas was organized by the oil companies in 1929.

The commission charges the respondents which combination and conspiracy to monopolize trade in TBA products and alleged they "agreed and conspired among themselves to purchase the commodities at illegally discriminatory prices and to receive illegal commissions, brokerage or other compensation."

Alleged practices cited by the FTC include the forcing of sellers to grant discriminatory prices, discounts, allowances, rebates, and terms and conditions of sale; replacing sellers who would not accede to such demands with others who did; entering into contracts whereby sellers agreed not to sell to Standard-Atlas competitors at prices lower than those charged Standard-Atlas; applying part of the savings obtained by these methods to finance a large and effective merchandising and sales-promotion organization; passing on to the Stand-

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ard companies, in the form of dividends on Atlas stock, rebates on purchases made through Atlas; and agreement between the Standard companies not to compete in the resale of products purchased through Atlas.

Since 1929, the commission asserted, the Standard companies have increased their percentage of total sales of TBA products from a negligible amount to 10 per cent of total replacement sales.

Examples of allegedly unlawful price discriminations received by the respondents, the FTC said, were purchases of tires and tubes from United States Rubber Co. at cost plus 6 per cent while competing distributors were required to pay higher prices; prices on batteries from Auto-Lite Battery Corp. approximately 25 per cent lower than competitors, and fan belts and radiator hose from Raybestos-Manhattan, Inc., approximately 28 per cent under those paid by competitors.

Import Rule Expires

Cut-rate quota on five oil products is not considered mandatory when Mexican agreement ceases at year's end

Bertram F. Linz

WASHINGTON.—Scrapping of the reciprocal trade agreement with the Netherlands under the General Agreement on Tariffs and Trade in 1948 has eliminated a quota requirement for the cut-rate importation of four oil products under the Venezuelan trade agreement when the Mexican agreement expires at the end of this year.

Under the Netherlands agreement, the United States was obliged to allocate tariff quotas on any article subjected to quantitative import restrictions, but no such provision is carried in the general agreement, and according to Commerce Department experts allocation of the oil quota appears to be no longer mandatory and is now a matter within the discretionary powers of the President.

In the event it is decided to make country assignments, however, a 1944 trade agreement with Iran will make it necessary to give that country an allocation based on its share of imports in a previous representative period.

Any allocation of the quota presumably would require assignments to a number of other areas not supplying the United States when the limitations were previously in effect from 1939 through 1942, including Kuwait, Saudi Arabia, and possibly Trinidad.

Venezuelan agreement.—Under provisions of the Venezuelan trade agreement which will again become effective next January 1, imports of crude oil, distillate fuel oil including gas oil and diesel oil, residual fuel oil, and topped crude will be permitted at an excise tax rate of 10½ per cent to the extent of 5 per cent annually of the quantity of crude processed in refineries in the continental United States during the preceding calendar year.

The latest Bureau of Mines forecast of 1950 crude runs to stills was 5,514,000 bbl. daily, which would make the 5 per cent quota 275,700 bbl. daily. Imports of the four products in the first 4 months of this year averaged 758,627 bbl. daily, and should that be the level of imports in 1951 the full duty of 21 cents a barrel would apply to 482,927 bbl. daily, or 64 per cent of total imports.

Asphalt and kerosine.—A fifth product also will be affected by the termination of the Mexican agreement. Petroleum liquid asphalt, including cutbacks and road oil, on which the agreement provided a rate of 10½ cents a barrel will revert to the statutory rate of 21 cents a barrel on all imports.

Still another product, however—kerosine—on which the Mexican agreement put a rate of 10½ cents a barrel, will continue to carry that rate because it is covered by the General Agreement on Tariffs and Trade.

TAXABLE IMPORTS

	Crude	Gas oil	Residual fuel oil	Topped crude	Total
Canada	356	3,752	457,498	253	461,859
Mexico	4,249,767	.....	326,042	2,999,862	7,575,671
Netherland W. I.	.....	21,897	43,154,893	.....	43,176,790
Colombia	11,424,841	76,069	113,962	.....	11,614,872
Venezuela	101,824,870	9,957	3,812,874	71,447	105,719,148
United Kingdom	.....	.....	1,800	.....	1,800
Iraq	343,860	.....	.....	.....	343,860
Iran	1,356,009	.....	.....	.....	1,356,009
Kuwait	23,075,548	.....	.....	.....	23,075,548
Saudi Arabia	12,459,937	.....	3,933	.....	12,463,870
Trinidad	89,173	472,321	661,093	.....	1,222,587
India	.....	.....	5,475	.....	5,475
Indonesia	14	.....	.....	.....	14
Spanish Africa	.....	.....	2,000	.....	2,000
Total	154,824,375	853,996	48,539,570	3,071,562	207,019,503
Barrels daily	424,176	1,600	132,985	8,415	567,176

The general agreement bound the import tax for distillate and residual fuel oil and topped crude at 10½ cents a barrel, but carried an escape clause in the form of a provision that the rate on those products is in no event to be less than the rate applicable to crude petroleum. The tax rate on crude was not a matter of negotiation in the general agreement and remained at that established by the Mexican treaty, and an increase in the rate on crude, accordingly, automatically lifts the rate on the other three products.

Other products.—The general agreement also provides rates on several petroleum products not covered by the Mexican treaty. Gasoline and other motor fuel is given a tax of 52½ cents a barrel; naphtha and light finished products, and unfinished oils for further processing, 10½ cents a barrel; lubricating oils, including paraffin oil, 84 cents a barrel; and petroleum jelly, petrolatum, and similar products are bound on the free list. Under the Internal Revenue Code and not covered by any agreement, solid petroleum asphalt is on the free list. Also importable free of duty are supplies for vessels and aircraft engaged in international commerce (bunkers), oil for manufacture under bond and export, and oil purchased abroad by the Government.

Commerce Department statistics show that total imports of crude, gas oil, residual fuel oil, and topped crude last year were 237,760,594 bbl., an average of 651,398 bbl. daily, of which 25,419,233 bbl. was bunkers, 226,293 bbl. receipts under bond, and 5,095,565 bbl. government purchases, leaving taxable imports of 207,019,503 bbl., an average of 567,176 bbl. daily.

Bunker imports consisted of 701,678 bbl. of gas oil, of which 485,538 bbl. was from the Netherlands West Indies, 214,577 bbl. from Venezuela, and 1,563 bbl. from Kuwait; and 24,717,555 bbl. of residual fuel oil, of which 24,610,159 bbl. was from the Netherlands West Indies, 100,255 bbl. from Venezuela, and 7,141 bbl. from Trinidad. Imports under bond consisted of 226,293 bbl. of residual from the Netherland West Indies.

Government purchases consisted of 1,079,184 bbl. of gas oil, of which 418,741 bbl. was from the Netherland West Indies, 352,426 bbl. from Saudi Arabia, and 308,017 bbl. from Bahrein, and 4,016,381 bbl. of residual, of which 3,966,739 bbl. was from the Netherland West Indies, and 49,642 bbl. from Trinidad.

Export Controls Stiffened

WASHINGTON. — Controls on the export of oil and gas production equipment and parts and petroleum refinery machinery, equipment, components and parts were stiffened last week by the Department of Commerce.

The department, effective without

WATCHING WASHINGTON

Bertram F. Linz

Controls Scramble

Administration officials are sharply at odds over the part to be played by the National Security Resources Board in the industrial-mobilization machine now being set up.

While the NSRB's original one-package measure covering all forms of control has been scrapped in favor of a plan for progressive adoption of controls as needed and their administration, so far as possible, by established agencies of the Government, board chairman W. Stuart Symington is making a strong play for a top position in the control setup.

The present policy is to have the Interior Department handle problems in the field of natural resources, and Symington last week told the National Petroleum Council that oil and natural gas would be dealt with by that department. The Agriculture Department would be responsible for food, the Labor Department for manpower control, and the Commerce Department would administer priorities and allocations of materials.

The NSRB, however, seems to have its own plans for moving in on this field and wants the basic decisions which would direct the policies to be followed. Under its proposals, the board would determine how much steel, for instance, should be earmarked for military use and how the remainder would be parceled out for nonmilitary purposes, and would have similar authority over oil.

War Story

Don C. Carroll, formerly of the Oil and Gas Division and until the Communist invasion with the Economic Cooperation Administration mission to Korea, is safely in Japan, with his wife and children who shortly will return to the United States, but minus the beginnings of what Don had hoped to make an outstanding collection of Korean art and antiques.

Carroll's retreat from Seoul was not without incident. He stayed to the last and participated in wrecking the embassy's radio station and destruction of its records.

Suspending his packing to go into the garden to watch Red planes shoot up the city, Carroll went back and speeded it up when tiles began to fly off his own roof. On the way to the Kimpo air field for evacuation, a Yak fighter buzzed his motor convoy but succeeded only in killing a lot of Koreans on the other side of the street. A little later, Don and the pilot of another Yak fought it out, Don with a .38 revolver; there were no casualties since the Yak appeared to be out of ammunition.

At present, Carroll is on loan to G-4 at General Headquarters in Tokyo, working on POL supply problems for the Korean operations, and is in and out of Korea on check-ups, planning to stay if possible for the rehabilitation of Korea.

Before leaving Seoul, Carroll hid his most valuable possessions about his house, where undoubtedly they have long since been liberated by the Reds, but what gripes him most is the theft of two perfectly good suits after his arrival in Japan. That hurt, because when he flew out of Korea all he could take was what could be packed in two bags.

Soft Competition

The Federal Trade Commission's attack on the TBA business of five Standard Oil companies points up what appears to have become the policy of the administration to "soak the consumer" to make soft competition for little business.

All of the many cases brought by the commission and the Department of Justice against the big corporations stress the plight of their small competitors, but never mention the plight of the consumer.

All of the talk in Congress emphasizes the need to keep little business going but carefully sidesteps the subject of prices.

Little business itself is cynical about the fate of the consumer, an outstanding example of its viewpoint being expressed recently by an independent and very prosperous-appearing tire dealer who told the House small business committee the tire dealers' association he represented opposed the cheaper tires offered by oil companies and mail order houses because "a lot of people will buy the cheaper tire, who would, in the absence of the cheap tire, pay a higher price for a tire."

And that appears, too, to be the attitude of the Government—if an equally good but cheaper product is not available the consumer will pay more and everybody will be happy except the consumer, the distributors who had been selling at lower prices, and the manufacturers who benefited by the wider markets those distributors opened up—which leaves only little business.

advance notice, ordered that validated licenses, heretofore required only for exports to Group R destinations, would be required for all shipments valued at more than $100 to all Group O destinations. Group O covers every part of the world except Canada, and includes Latin America which was not covered by Group R.

Department officials explained that the order was not related to the war situation directly and that no question of availability of supply was involved but, with other similar orders that have been or will be issued, gives the Government a stronger control of exports to safeguard against shipments which might eventually find their way to communistic countries.

Synthetic-Rubber Expansion

WASHINGTON. — The Munitions Board disclosed last week that the Reconstruction Finance Corporation, with the support of the Defense Department, is considering the elimination of the requirement for natural rubber in heavy-duty truck tires with a view to reducing our strategic dependence upon that product.

In a report on the progress of the program for stockpiling strategic and critical materials, the board disclosed it has discontinued the possibility of improving the availability of natural rubber from current production in or near the United States.

Political and economic conditions in the principal producing areas discourage expanded investment on new plantations which will require 8 years between planting and the first harvest, the board pointed out, while increased production in other areas, such as South America and Africa, is a difficult and long-range operation and probably would require heavy subsidization to achieve substantial results.

"Accordingly," the report said, "the only remaining solution other than reduced consumption is by increased production of synthetic rubber. This synthetic production could then replace natural rubber in many industrial uses, thereby increasing the availability of natural rubber for stockpile."

In addition, the board said, accelerated research in production of synthetic rubber is also needed to improve the product and reduce its costs.

Nationalization Rebuff

WASHINGTON.—Nationalization of the oil and natural-gas industries has been ruled out by the administration.

The draft of a bill to nationalize those industries, together with coal, water power, and the railroads, submitted to President Truman by the People's Lobby last month, was rejected by the Budget Bureau, to which

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it had been referred, with the comment that "it would not be in conformity with the program of the President to sponsor proposals so far-reaching."

Nationalization, the bureau made clear, is not felt to be in conformity with American concepts of free competition and private initiative. Whereas suggestions for legislation that are offered the President ordinarily are disposed of with a word of thanks and a promise they will be considered, the bureau apparently considered the issue raised by the People's Lobby so important as to warrant a more definite statement of the administration's position.

"Your proposals with respect to the public ownership of coal, oil, water power, and natural gas, plus the public ownership of one basic transportation system, i.e., the railroads, are far-reaching and controversial, to say the least," the bureau wrote. "Indeed, it may be safely said that some of the great chapters of the evolution of social and political systems in the world have been and will continue to be written around the decisions which various peoples make on such issues.

"Almost all would agree that, in a free society, changes of such proportions and import on the social and political system should not be made, if at all, before adequate discussion of the issues and experimentation with the problems involved have been undertaken."

No More Canol Projects

WASHINGTON.—The Senate served notice on government agencies last week that it will maintain constant surveillance over the rearmament and preparedness program to insure against the recurrence of such things as the wasteful Canol project undertaken by the War Department in the last war.

An Armed Services watchdog subcommittee has been named by Chairman Millard F. Tydings of Maryland to serve in the capacity of the old Truman war-investigating committee, with Sen. Lyndon B. Johnson of Texas as chairman, and Sens. Virgil Chapman of Kentucky, Estes Kefauver of Tennessee, Lester C. Hunt of Wyoming, Styles Bridges of New Hampshire, Leverett Saltonstall of Massachusetts, and Wayne Morse of Oregon as members.

Tydings said one of the purposes of the subcommittee will be to explore bottlenecks, delays, shortages, and other deterrents to the rearmament program. To this extent, a forum will be provided for industrialists who find themselves hampered in vital production and may be the place to which the oil industry can go with material or other problems which government officials prove unwilling or unable to solve.

"If anyone knows of any problems having to do with stoppages or difficulties in the armed services, in our preparedness program, in our procurement program, this committee, which is set up to deal with such matters and which will have an adequate staff, should be notified and it will investigate the situation," Tydings said.

INDUSTRY AFFAIRS

High Octane

July survey shows continued climb in ratings of motor fuel throughout country; tetraethyl lead use rising

John C. Casper

A CONTINUED steady climb in the octane rating of both regular and premium gasolines in all parts of the country is shown in the July survey of E. I. du Pont de Nemours & Co., Inc.

With few exceptions every one of the 42 United States and 3 Canadian cities surveyed had higher ratings in July than in the January and April surveys. Comparison with the du Pont survey of a year ago shows increases in both regular and premium in every city, many of them substantial.

Present ratings, however, may be close to the maximum for some time if, as expected, military demands for aviation gasoline require the diversion of components of high-octane motor fuel. *(See "Octane Race Halted," The Oil and Gas Journal, July 27, page 159.)*

Highest ratings in the country are in East Coast cities, where premium tested in July averaged above 92 numbers by the research method. Houston showed a similar rating because much of the gasoline produced in that area is marketed on the East Coast and must be competitive in quality with that produced by eastern refineries.

In May 1949 du Pont surveyed mo-

COMPARISON OF 1950 MOTOR-GASOLINE SURVEYS
(Octane numbers by research method; arithmetical averages by cities)

	Premium				Regular			
	Octane No.			TEL content, cc./gal.	Octane No.			TEL content, cc./gal.
	Jan.	Apr.	July	July	Jan.	Apr.	July	July
Aberdeen	....	86.6	87.6	2.69	....	80.4	81.3	1.86
Amarillo	86.0	87.7	86.8	2.76	78.6	80.3	80.5	2.43
Atlanta	90.0	91.0	91.6	1.96	83.9	84.9	85.0	2.37
Bakersfield	89.0	88.8	88.7	2.94	81.5	80.6	80.8	1.79
Baltimore	90.8	91.8	82.3	1.87	85.3	85.6	86.3	1.85
Boston	91.1	91.5	91.9	2.27	85.6	86.4	86.4	1.94
Calgary	....	84.4	84.5	2.79	....	79.3	78.8	2.02
Casper	88.6	88.1	88.5	1.46	81.6	82.0	81.5	1.31
Charlotte	....	90.9	91.1	1.94	....	84.8	85.2	2.20
Chicago	86.9	88.2	89.1	2.00	81.4	82.6	82.8	1.83
Cincinnati	90.2	89.8	90.9	2.58	84.8	85.1	85.3	2.24
Cleveland	89.9	89.8	90.9	2.38	84.9	85.2	86.1	1.86
Columbus	90.0	89.8	91.0	2.48	84.4	85.4	86.3	2.12
Corpus Christi	89.6	92.2	91.3	2.00	83.8	85.1	84.7	1.95
Dallas	89.0	92.0	91.4	2.49	82.9	84.0	84.4	2.43
Denver	88.6	87.6	88.3	1.65	81.9	81.4	81.0	1.42
Detroit	89.5	90.2	90.4	2.51	84.2	84.2	85.8	2.12
El Paso	84.2	85.5	86.0	2.80	76.7	76.5	78.5	2.20
Great Falls	85.2	87.1	89.7	2.00	81.4	80.8	81.9	1.39
Houston	90.0	92.2	92.2	2.29	83.8	84.9	85.9	2.42
Indianapolis	....	88.1	89.3	2.78	....	83.0	83.6	2.33
Jacksonville	....	90.6	91.0	1.82	....	85.6	85.9	2.21
Kansas City	88.2	89.6	89.8	2.38	81.7	82.8	83.5	1.80
Little Rock	....	90.6	90.3	2.22	....	84.2	83.9	1.94
Los Angeles	90.1	90.1	90.8	2.40	83.3	82.8	82.9	1.80
Louisville	89.5	90.9	90.6	2.59	83.5	84.5	84.7	2.60
Memphis	89.6	90.2	90.6	2.38	84.3	84.8	84.3	1.97
Milwaukee	88.0	88.3	89.3	2.24	80.6	82.4	82.9	2.02
Minneapolis	86.9	87.6	87.8	2.63	81.3	80.6	81.9	2.04
Montreal	88.9	88.7	88.8	2.35	82.5	84.2	84.5	2.28
Nashville	89.8	90.5	90.0	2.38	84.2	84.7	84.7	1.93
New Orleans	89.1	90.5	91.4	2.63	83.2	85.6	84.6	2.30
New York	90.3	90.8	92.4	2.40	84.9	85.4	86.2	2.12
Omaha	....	88.3	88.3	2.44	....	80.9	82.3	1.90
Philadelphia	90.1	91.7	92.3	2.12	85.1	86.4	86.9	1.85
Pittsburgh	91.2	91.6	91.2	2.31	85.5	85.8	86.6	2.18
St. Louis	87.6	88.9	89.4	2.57	81.6	83.3	82.9	2.06
Salt Lake City	88.8	88.5	87.8	1.79	79.8	80.1	79.5	1.12
San Francisco	91.5	90.7	91.3	2.25	83.2	83.2	82.9	1.44
Seattle	91.2	90.9	90.9	2.37	83.4	82.7	82.2	1.75
Shreveport	87.7	89.8	89.6	2.57	82.8	84.4	83.9	2.43
Spokane	....	89.1	90.5	1.73	....	82.4	82.4	1.58
Toronto	87.0	87.0	88.3	2.05	81.7	82.4	84.2	1.74
Tulsa	87.1	88.6	88.7	2.64	81.0	81.3	82.2	2.28
Wichita	85.9	86.8	87.1	2.59	80.9	81.3	81.2	2.24

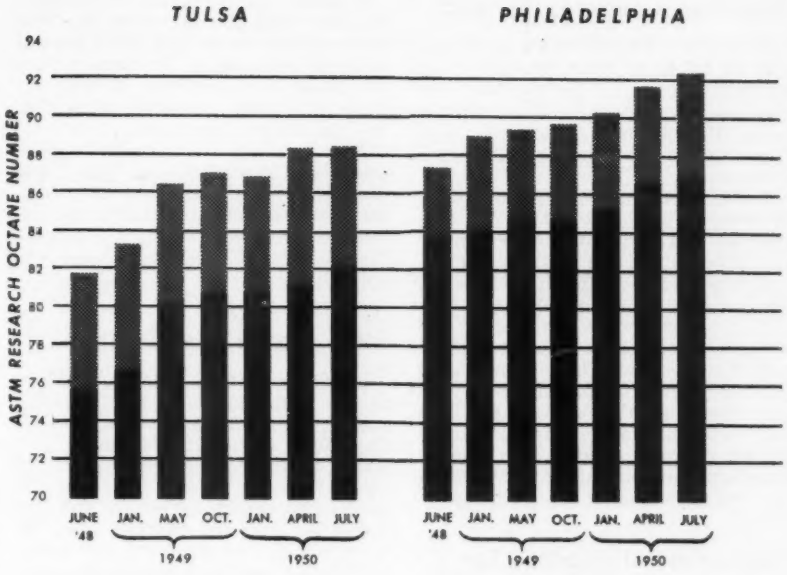
tor fuel in 29 cities which are also included in the current list. Comparison of the two shows an increase in the rating of both regular and premium in every one of the 29 cities. On regular grade, 5 cities (17.2 per cent) increased 3 or more octane numbers (research method); 12 cities (41.4 per cent) increased between 2 and 3 numbers; 10 cities (34.5 per cent) increased between 1 and 2 numbers; and 2 cities (6.9 per cent) increased less than 1 number.

On premium, 15 of the 29 cities (51.7 per cent) increased more than 3 numbers; 5 cities (17.2 per cent) increased between 2 and 3 numbers; 6 cities (20.7 per cent) increased between 1 and 2 numbers; and 3 cities (10.4 per cent) increased less than 1 number.

Further comparison of the May 1949 and July 1950 surveys indicates that the increase in octane ratings has been achieved more by the addition of tetraethyl lead than by improved base stocks. In May 1949 the regular grade tested in the 29 cities averaged 1.53 cc. of lead per gallon, but this increased to 1.97 per gallon in July 1950, an increase of 0.44 cc. per gallon, or 28.7 per cent.

The premium tested in the 29 cities averaged 2.01 cc. per gallon in May 1949, and 2.31 cc. in July 1950, an increase of 0.30 cc. or 14.9 per cent.

The accompanying large table shows the three du Pont surveys made during 1950. The smaller table gives unweighted arithmetical averages of the figures in the April and July surveys, showing recent trends.



These charts from the Du Pont survey show the difference in octane rating in typical Mid-Continent and East Coast markets. Black bars are regular grade and hatched areas are premium gasoline. This regional variation has existed for years, but the trend has been upward in all parts of the country.

	Research octane numbers		TEL content (cc. per gal.)	
	Apr.	July	Apr.	July
Premium ...	89.4	89.8	2.03	2.32
Regular	83.2	83.5	1.61	1.97

Octane for War

Alkylate diversion to aviation fuel won't hurt civilian gasoline now but quality may suffer when demand rises

George Weber

NEW YORK.—The belief that military needs for aviation gasoline in the immediate future can be met without any serious disruption of civilian gasoline production, voiced last week by the National Petroleum Council, is confirmed by opinion in the refining industry generally.

The council assured the military services that their augmented needs for high-octane fuel, as now projected, can and will be provided quickly.

In the long-range, considering military aviation-gasoline demands for next year, it is conceded that substantial diversion of high-octane blends from civilian use and the modification of refinery operations to produce more aviation fuel may well bring reductions in both the octane and volume of motor fuels available to the public. That eventuality is receiving serious consideration at present.

Alkylates.—The simplest and most immediate means for increasing production of aviation gasoline is diversion of alkylates from motor-fuel blending. This prime component of aviation gasoline has entered the picture more and more as the civilian octane race progressed this year.

In order to meet competitive motor fuel quality, a number of refiners have increased their alkylation operations. While most of the alkylate production is currently going into aviation gasoline, there remains an estimated 10 to 20 per cent being blended to motor fuels. This fraction, it is believed, will suffice to meet military needs for the remainder of the year, barring unforseen changes in military demand.

Refiners utilizing alkylates to improve their motor fuels are expected to make such blends available for military use. On a strictly voluntary basis, it was suggested they may purchase high-octane motor-fuel blends from others to maintain their position in the quality market.

At the close of World War II the American refining industry maintained 56 alkylation units with a total productive capacity of about 157,500 bbl. per day Of these, 25 with a total productive capacity of about 56,300 bbl. per day, employed hydrofluoric acid as a catalyst and the remaining 31 plants, with 101,200 bbl. per day capacity, used the sulfuric acid process.

Plants surveyed.—Early postwar operations saw a sharp decline in alkylation and some plants were converted to other uses or shut down. At present, a preliminary survey shows a total of 40 of the original 56 plants in operating condition, totaling about 115,000 bbl. per day. One additional 3,000-bbl. unit, the first to be built since the war, is under construction on the eastern seaboard. A survey is now being conducted to determine exactly what plants are operable and how much they might be able to produce, provided demand for aviation gasoline rises substantially.

As regards raw materials, aviation gasoline competes on two fronts with synthetic rubber and other petroleum-derived products of military importance. It may comprise as much as 70 per cent of alkylates which are in turn derived chiefly from the butanes and butylenes now in increasing demand for expanded synthetic-rubber production.

Aromatic hydrocarbons, representing another important component of aviation gasoline, are presently in very short supply because of declining production from coal tar and sharply increasing demand from rubber, synthetic fiber, and other chemical industries.

XUM

Pipe-Line Company Formed

GRAND RAPIDS, Mich. — Formation of Michigan-Ohio Pipeline Corp. has been announced by Mid-West Refineries, Inc. The new firm will acquire the 250-mile crude-oil trunk line of Sohio Pipe Line Co.'s Michigan division.

These lines, according to L. A. Woodward, president of Mid-West Refineries and head of the new pipeline firm, extend from Toledo to Freeman and Buckeye, Mich., in the oil area of Central Michigan.

C. A. Schrader, vice president and general manager of Michigan-Ohio, said that there will be no changes in present operating personnel of the pipe lines, and that operating offices will continue to be maintained in Mount Pleasant, Mich. Also, Michigan-Ohio will continue to serve Michigan refineries, as in the past.

Production Allowables Set

Three states have set new crude-oil production allowables for August, two of them raising output slightly, and the other keeping production at the same level as that of July.

Oklahoma's new figure, effective for August and September, has been set at 472,540 bbl. daily, compared with July allowables of 454,925 bbl. daily. Louisiana raised its output for August to 604,441 bbl. daily, compared with 600,835 bbl. daily during July.

Kansas' Corporation Commission directed that the allowable for that state remain unchanged at 300,000 bbl. daily during August. Production from this state is averaging 285,000 bbl. daily at present, compared with 228,000 bbl. daily a year ago.

Texas' allowable, which is now based on Most Efficient Rate, was previously announced by the Railroad Commission as 2,580,328 bbl. average calendar-day output for August. This is 107,523 bbl. daily over the July figure.

Steel Committees Named

WASHINGTON.—With instructions to rush their studies with all possible speed, National Petroleum Council Chairman Walter S. Hallanan last week announced the appointment of committees to survey the essential steel requirements of the oil and gas industries and the storage capacity for crude oil and products, and assist on military and government requirements. The investigations were requested by Interior Secretary Oscar L. Chapman prior to the NPC meeting July 25.

Hallanan named Russell B. Brown, general counsel of the Independent Petroleum Association of America, as chairman of the steel requirements committee, with the following members:

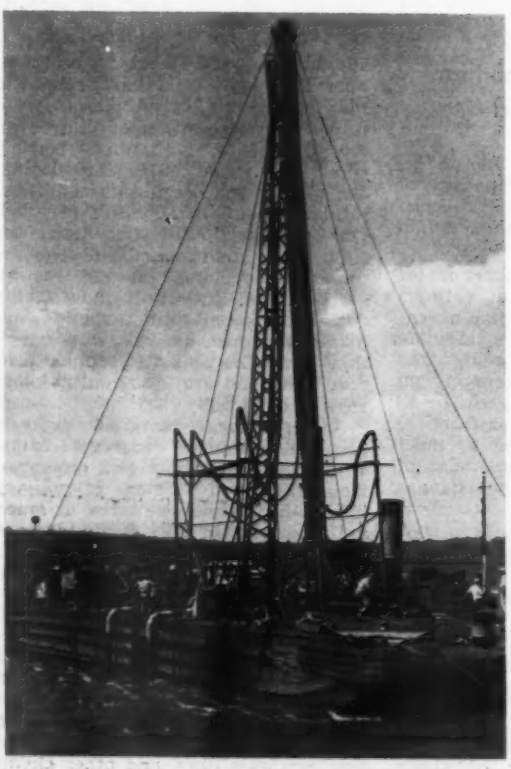
K. S. Adams, Phillips Petroleum Co.; Hines H. Baker, Humble Oil & Refining Co.; Warren S. Churchill, American Association of Oilwell Drilling Contractors; Stuart M. Crocker, Columbia Gas System, Inc.; J. C. Donnell, II, Ohio Oil Co.; Fayette B. Dow, National Petroleum Association; R. G. Follis, Standard Oil Co. of California; Robert L. Foree, Texas Independent Producers and Royalty Owners Association; B. C. Graves, Union Tank Car Co.; R. H. Hargrove, Texas Eastern Transmission Corp.; Harry B. Hilts, Atlantic Coast Oil Conference, Inc.; Eugene Holman, Standard Oil Co. (N.J.); D. A. Hulcy, Lone Star Gas Co.; B. Brewster Jennings, Socony-Vacuum Oil Co., Inc.

William M. Keck, Jr., Superior Oil Co.; B. L. Majewski, Deep Rock Oil Corp.; L. F. McCollum, Continental Oil Co.; N. C. McGowen, United Gas Corp.; S. F. Ninness, National Tank Truck Carriers, Inc.; Frank M. Porter, American Petroleum Institute; Walter R. Reitz, Quaker State Oil Refining Corp.; A. S. Ritchie, Wichita; W. S. S. Rodgers, The Texas Co.; A. H. Rowan, A. H. & L. C. Rowan; W. G. Skelly, Skelly Oil Co.; Reese H. Taylor, Union Oil Co. of California; G. A. Tompson, Petroleum Equipment Suppliers Association; J. Ed Warren, Independent Petroleum Association of America; Robert E. Wilson, Standard Oil Co. (Ind.); H. E. Zoller, Derby Oil Co.

The storage-capacity committee is composed of L. S. Wescoat, Pure Oil Co., Chicago, chairman; H. T. Ashton, Western Petroleum Refiners Association; Paul G. Blazer, Ashland Oil & Refining Co.; Horace E. Davenport, Independent Oil Men's Association of New England; Charles S. Jones, Richfield Oil Corp.; John M. Lovejoy, Seaboard Oil Co. of Delaware; Baird H. Markham, American Petroleum Industries Committees; Rankin P. Peck, National Congress of Petroleum Retailers, Inc.; M. H. Robineau, Frontier Refining Co.; Roland V. Rodman, Anderson-Prichard Oil Corp.; Clarendon E. Streeter, Pennsylvania Grade Crude Oil Association; W. W. Vandeveer, Cleveland.

Membership of the committee on military and government petroleum requirements, headed by B. Brewster Jennings of Socony-Vacuum Oil Co., Inc., as chairman, and J. Frank Drake, Gulf Oil Corp., Pittsburgh, as vice chairman, is as follows: Hines H. Baker, Humble Oil & Refining Co.; T. H. Barton, Lion Oil Co.; Jacob Blaustein, American Trading & Production Corp.; Reid Brazell, Leonard Refineries, Inc.; Bruce K. Brown, Military Petroleum Advisory Board; H. S. M. Burns, Shell Oil Co.; R. G. Follis, Standard Oil Co. of California; B. I. Graves, Tide Water Associated Oil Co.; W. T. Holliday, Standard Oil Co. (Ohio); J. P. Jones, National Stripper Well Association; W. Alton Jones, Cities Service Co.; Harry Leyendecker, Independent Refiners Association of America.

B. L. Majewski, Deep Rock Oil Corp.; J. Howard Marshall, Ashland Oil & Refining Co.; L. F. McCollum, Continental Oil Co.; P. C. Spencer, Sinclair Oil Corp.; Reese H. Taylor, Union Oil Co. of California; W. W. Vandeveer, Cleveland; Robert E. Wilson, Standard Oil Co. (Ind.).



JET SPUD.—This barge-mounted steel spud is a part of the equipment being used by Omaha Dredge & Dock Co. in the Hudson River crossing of Transcontinental Gas Pipe Line Corp. The crossing, a key link in the Texas-New York line, is expected to be completed August 8. The Hudson crossing is unusual in view of the size of the line, engineering problems, and new techniques being used. This 115-ft. spud mounted on a 256-ft. barge is shown furrowing the river bottom from Edgewater, N. J., to 134th Street in New York. The spud is lowered through a well in the barge to the river bed and feels its way along to detect any obstructions. Air and water forced through jets at high pressure cut a 25-ft. deep trench in the river-bottom silt.

CANADA

Helicopter Surveys

Exploration surveys are now being carried out in the Northwest Territories of Canada by helicopter. The helicopter is being used under contract by Associated Helicopters, Ltd., Edmonton, and the work initially is centered in an area about 500 miles north of Edmonton. This is said to be the first oil-company use of helicopters in the Northwest Territories, though similar operations have been carried out in other parts of Canada and the Yukon. In addition to geological work, the helicopter is being used for seismic surveys.

Kent County

Scurry's northern neighbor takes the West Texas spotlight as Pennsylvanian lime discoveries hint of reef formations

Roy F. Carlson and Carl F. Hoot

CLAIREMONT.—Kent County, which long played the role of poor neighbor to fabulous Scurry County just to the south, is now assuming a major place in the West Texas oil play.

Even Kent's first bid for the spotlight—the Cogdell discovery of Chapman & McFarlin in January 1950—was spoken of in relation to Scurry's North Snyder pool, and probably rightly so since the play was from a spread running far south of the county line.

A large portion of Cogdell is in Scurry and may prove to be part of the same reef mass as several other Scurry fields. But the northern part of Cogdell, with boundaries still undefined, lies in Kent, as shown by the accompanying map.

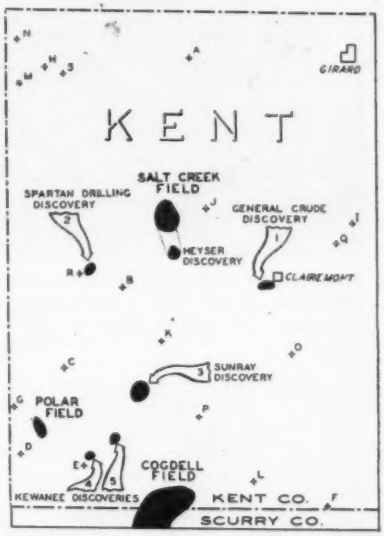
Kent County has a lot more oil, though. Besides the old Polar Ellenburger pool in the southwest corner it has several new discoveries that show great promise.

One of the first of these fields was found almost in the county seat of Clairemont. Here an active town-lot drilling campaign is under way developing production from the Pennsylvanian Strawn formation. Rather than having to ignore the huge Scurry development, Kent County citizens can now watch rigs working in their own backyards, and receive royalty checks in their shanty postoffice.

The first well here was drilled to a total depth of 6,752 ft. and found the top of the pay at 6,742 ft. Initial potential was 384 bbl. per day. The field is indicated by arrow No. 1 on the map.

North and west of Clairemont another active and promising field is developing—the Salt Creek field, discovered by the Mary Hunt Trust Estate 1 J. W. Young in April. This well produced an initial potential of 2,184 bbl. per day from the Canyon reef from 6,484-6,520 ft. Elevation of the well is 2,088 ft. The well rapidly acquired offsets that were good producers, and a 2-mile semiwildcat, Estill Heyser, Jr., 2 L. T. Lohman, produced from the reef below 6,470 ft. at a minus datum of 4,343 ft.

RIG NEAR CLAIREMONT.—Northeast of the town, Sun Oil Co. is almost ready to test 1-A Wallace, important location on the firm's huge block in an eastern periphery around Clairemont.



HOT SPOT.—The area north of the Cogdell field is shown on the above map. Dry holes are indicated by letters, and are tabulated in the table at the bottom of the page. Arrows indicate discovery wells.

with an initial potential of 547 bbl. per day.

What appears to be another major discovery was made by the Barnsdall 1 Spires (now Sunray Oil Corp.) in the area between Salt Creek and Cogdell fields. The pay here is called Strawn and is found between 6,755 and 6,771 ft. Elevation of the surface is 2,145 ft. Initial production was 400 bbl. per day. This discovery is indicated by No. 3 on the map.

Still another Strawn discovery was made by Spartan Drilling Co. et al., 1 J. W. Young, 11 miles west of Clairemont. The Strawn here produced 51 bbl. per day from 7,353-59 ft. This field is as yet unnamed and is designated on the accompanying map by No. 2.

Two small San Andres producers have been brought in in the south-

KENT COUNTY DRY WILDCATS

Map letter	Name	Comp. date	Elev.	TD	Formation tops
A	W. H. Hunt Trust Est. 1 Girard Trust Co.	4- 3-50	2,121	7,675	Reef 6,855, lime 6,971, E-7,662.
B	Ted Weiner and Sohio 1 Corricker	4- 2-50	2,252	7,683	SAn 2,200, Canyon lime 6,695, reef 6,727, St 6,995, E-7,676*
C	Slick Moorman Oil Co. 1 E. H. Wallace	3-10-50	2,183	7,791	Gl 2,243, Cf 2,281, Penn 4,960 St 6,974, Miss 7,384, E-7,588*
D	Humble 1 O. N. Blair		2,305	7,925	SA 1,595, Cf 2,680, Miss 7609, E-7,817.
E	Drilg. & Expl. Co. 1 Wilson Connell	3-15-50	2,371	7,931	SAn 2,423, Cf 2,575, Penn 7,001, St 7,128, E-7,740†.
F	Coronado et al., 1 Fleming	5-14-50	2,032	7,260	Lime 6,620, Miss 6,970, E-7,200.
G	American Liberty 1 Connell-Young	9- 5-46	2,271	7,925	SA 1,542, Gl 2,450, Cf 2,630, E-7,775.
H	Blackwell Oil & Gas Co. 1 A. A. House	2-10-45	2,316	7,775	SA 2,110, San 2,310, Cf 2,525, Penn 5,840*.
I	Davis and Hiawatha 1 Bert Wallace	5- 8-49	2,037	7,135	Cf 1,400, Penn 5,504, Miss 6,800, E-7,084.
J	General Crude 1 Percy Jones	9-30-48	2,036	7,589	Penn 4800, Miss 7,140, E-7,430.
K	Estill Heyser 1 L. T. Lohman	4-17-50	2,129	7,541	St 6,778, Miss 7,280, E-7,485.
L	Mid-Continent 1 Billy Wallace Tract 3	4-18-50	2,032	7,415	SA 980, SAn 1,640, Cf 1,860, Wp 3,700, St 6,701, Miss 7,028, E-7,336*.
M	Ohio Oil Co. 1 J. J. Emery Trust	6-22-49	2,223	7,842	SA 1,320, Gl 2,262, Cf 2,470, Wp 4,460, Reef 6,062, E-7,807.
N	Ryan Hays & Burke 1 Kenny	1-20-50	2,324	7,509	SAn 2,440, reef 6,484.
O	Seaboard and Republic Nat. 1 B. B. Wallace	6-27-50	2,221	7,274	Lime 6,931, Miss 7,230.
P	Sohio 1 W. A. Mays	7-10-45	2,184	7,762	SAn 2,000, Penn 5,550, St 5,825, E-7,562.
Q	Sohio 1 E. E. Wallace	11- 6-45	2,097	7,278	*
R	Spartan et al., 1 E. E. Wallace Est.	6-16-50	2,343	7,865	E-7,838 *.
S	L. H. Wentz 1 L. B. Fuqua	1- 9-49	2,295	6,977	SA 1,450, Gl 2,223, Cf 2,431, reef 6,217.

*Gas and oil shows on drill-stem tests. †San Andres producer. SA—San Andres; SAn—San Angelo; Gl—Glorietta; Wp—Wolfcamp; Cf—Clearfork; E—Ellenburger; St—Strawn; Penn—Pennsylvanian; Miss—Mississippian.

XUM

COURTHOUSE AND POST OFFICE.—Kent County's courthouse is shown at left. Although not an imposing structure, this stone building, constructed in 1892, houses multitudinous oil-lease and royalty records potentially aggregating hundreds of millions of dollars in value. Post office at Clairemont, shown at right, is about as small as they come. Clairemont is in the geographic center of Kent County, indisputably the No. 1 hot spot of reef oil activity after Scurry itself.

DISCOVERY NEAR CLAIREMONT.—Located ½ mile southwest of Clairemont townsite is 1-A Percy Jones, Strawn discovery well of General Crude Oil Co., above. It was completed for initial production of 384 bbl. per day of 38.7°-gravity crude, through ¼-in. choke. Strawn top was 4,596, and GOR was 400:1. All of Kent County is under lease, including all town lots in nearby Clairemont. Below, crew of J. J. Willis Construction Co., Odessa, Tex., is shown laying 8-in. pipe line for Sun Oil Co. 13 miles to Service Pipe Line Co.'s Cogdell station.

EATS ARE SCARCE.—Not because there is a shortage of food, but because eating houses are few and far between. This brand-new "oil" cafe is as yet the only eating place in a 25-mile radius in Kent County.

west corner of the county. One is listed on the dry-hole table, and is shown as a dry hole on the map. A diagonal offset to this well is shown by arrow No. 5. This well produces about 12 bbl. of oil per day, with a large quantity of water. The well shown as a dry hole produces in a like manner.

Kewanee 1-C Wilson Connell, the most recent Pennsylvanian lime discovery in Kent County is indicated by arrow No. 4. This well potentialed 328 bbl. per day from 6,850 ft. Total depth is 6,880 ft. and the top of the pay has been called at 6,855 ft. Elevation of the well is 2,219 ft., making the top of the pay about 300 ft. low to the pay in Salt Creek field, and nearly flat with the Barnsdall discovery.

As shown by the map, there are dry wildcats scattered like buckshot throughout the county. These presumably mark limits of development for some of the fields that have recently been discovered. Other pools may eventually prove continuous, but if and how they do will only be shown by concentrated drilling, since geophysical pictures are apparently not conclusive. The reefs themselves, if they are reef structures, are surely unpredictable. The popular and safest designation now is Pennsylvanian lime. In any event, Kent County has oil, in quantity, and great promise of more.

Production Climbing

Shut-in heavy-crude wells, reopened, result in gain in California's production; heavy-crude prices raised

D. H. Stormont

LOS ANGELES.—Continued reopening of shut-in heavy-crude producing wells is pushing California's oil production to new yearly highs each week. Furthermore, producers are obtaining from 15 to 35 cents per barrel for 14°-gravity than they were in the early part of the year.

Current daily production is about 889,800 bbl., or 25,000 more than was being produced at the first of June. A considerable portion of this increase, around 14,000 bbl., is the result of placing on production some of the 3,000 heavy-oil producers which were closed in at the first of the year.

Despite the higher rates of heavy-oil production, stocks of these crudes and residual fuels have continued to decline. Latest A.P.I. reports indicate them to be about 18,000,000 bbl., the lowest level since June 1948 and about half of what they were a year ago.

Insofar as production is concerned the latest development was Standard Oil Co. of California's announcement that it was reopening an unstated number of heavy-oil producers in the Coalinga, Kern River, McKittrick, and Poso Creek fields. Opening of these wells, however, was to replace production the company will lose early in August in the Elk Hills field.

The primary period of Standard's contract with the Navy reportedly expires on August 2. In accordance with the terms of the contract, Standard's production from the Stevens zone in the Elk Hills Naval Reserve is to drop from the current 6,000-plus barrels to around 600 bbl. daily.

Prices raised. — Standard announced another increase in price of heavy crude effective July 26, and at the same time announced an increase in the selling price of residual fuel.

Under the new schedule the company generally increased its buying price for 14°-gravity crude by 10 cents a barrel. Smaller increases were posted for other gravities up to 25°. Residual-fuel prices were increased 10 cents a barrel.

This is the second crude-price increase by Standard in less than a month. The first change, effective June 29, was on a graduated scale from a 15-cent rise for 14°-gravity to 1 cent for 25-25.9°- gravity.

In the way of price improvement, however Socal went only half way in meeting Union Oil Co.'s recent advance of 20 cents per barrel for 14°-gravity crude. After Standard's price advance last week, General Petroleum Corp. posted a similar 10-cent advance, and like Socal boosted the selling price of heavy fuels by 10 cents per barrel.

Postwar changes in the West Coast heavy fuel market are reflected in price changes of any typical heavy crude from the area. After the last general crude-price increase in December 1947, the schedule for Wilmington crude started at 14-14.9° gravity and $2.13 per barrel. This price held until January 25, 1949, when it was cut to $1.93. Another cut followed on April 1 of that year, bringing the price down to $1.63. Prices in other fields were adjusted during the summer but Wilmington was not cut again until September 2 when the posting was reduced to $1.28.

The first market improvement raised the price to $1.43 per barrel, effective June 29, 1950. Under Standard's new posting the company will pay $1.53, still 60 cents less than in December 1947.

Effect on stocks.—The deep cuts in heavy crude prices throughout 1949 resulted from decreases in the demand for heavy fuel oil, and in like manner, this summer's improved prices indicate a more stable residual market.

In the period from the first of August 1948 until the end of July 1949, residual fuel stocks in California increased 18,329,000 bbl., or about 50,000 bbl. daily. Residual production was cut back but excess inventories had to be reduced. The only solution, aside from drastic and balance-disturbing cuts in production, was to sell surplus outside California's normal trade area. About the only possible outlets were on the East Coast, and the long tanker haul was expensive.

In October 1949, when the posted residual price at San Pedro was $1.25 per barrel, suppliers were offering material for shipment to East Coast at 95 cents f.o.b. California ports.

The California - East Coast movement started in August 1949 with one tanker and increased each month to reach a peak of 3,401,000 bbl. in February. Shipments in the period from August 1, 1949, to July 15, 1950, totaled 18,900,000 bbl.

Since total reduction in West Coast residual inventories in the 1-year period ended July 22, 1950, was only 19,900,000 bbl., the California cutback in residual production actually accounted for only 1,000,000 bbl. of the stock liquidation.

However, the heavy inventory burden has been removed, and the West

DOUBLE HEADER.—The East Texas field is notorious for close spacing of wells, but these two leases in Kilgore are so small that neither one had space for a pump jack. So the operators devised this double-duty beam which pumps one well at each end. Shell Oil Co., which furnished the photo, believes this is the only such contrivance in the world.

XUM

Coast residual market, under normal conditions, would become more stable.

Increased military activity in the Pacific will promote stronger West Coast product markets. Operators will be operating again under abnormal conditions, but this time the problem will be how to increase production rather than how to reduce inventories.

R. G. Follis, chairman of the board of Standard of California, said here last week in commenting on current developments in the oil industry:

"The business outlook has steadily improved in recent months, with growing crude-oil production and increasing sales both in the West and and on the East Coast.

This trend was evident before the reflection of any military demand growing out of the action in South Korea.

"Because of its geographical location, California undoubtedly will be called upon to supply a substantial part of the new military needs. Considerable potential production was shut back in this state many months ago, and is available for addition to the military supply when needed.

"In addition, Standard of California and other West Coast companies have spent several hundred million dollars since the end of World War II in new and rehabilitated refinery, transportation, and other facilities, which also are available. We are in much better situation to meet international emergencies now than we were in 1941."

Gas Conversion

Association discusses advent of natural gas

SEATTLE. — Preparation for the advent of natural gas in the Northwest was the theme of the annual meeting of the Pacific Coast Gas Association here July 31-August 3.

E. G. Lawson, president of Pacific Public Service Co. San Francisco, was elected president of the association for the coming year. W. M. Jacobs, vice president of Southern California Gas Co., Los Angeles, was elected vice president, and Harry McGann, auditor of division accounts for Pacific Gas & Electric Co., San Francisco, was elected treasurer.

E. G. LAWSON

Among the featured speakers was Premier Ernest C. Manning of the Province of Alberta, Canada, who described the development of gas resources in Alberta and the several pending proposals to export natural gas to Pacific Coast cities. Explaining that the provincial government has not yet decided an export policy, the premier promised that the door would not be closed to supplying gas to this area after domestic requirements have been met.

Some practical advice on preparing for the introduction of natural gas was given Northwest gas companies by K. W. Stookey, president of Gas Machinery Co., Cleveland.

He anticipated that within a couple of years the Northwest will be in the same position as New England and other eastern states at present, namely, preparing for delivery of natural gas from long-distance pipe lines. This will not only cause a conversion problem, he warned, but also will increase the peak-load demands because of the almost certain increase in the use of gas for home heating.

W. M. JACOBS

HARRY McGANN

These problems are being met by many eastern operators, Stookey said, by use of the Hall process for making high-B.t.u. gas from residual fuel oil. Since the resulting gas is virtually interchangeable with natural gas the Hall process is useful both in the interim period while preparing to use natural and to supplement natural during peak-load periods.

Gas-oil processes familiar to Pacific Coast operators, Stookey explained, use distillate fuel oil and produce a gas of low heat content which has been used for supplementing other manufactured gas but never as the entire source of supply. The Hall process, developed by research of the American Gas Association, he explained, can produce the entire supply at a lower cost than the older processes and the gas will have about the same B.t.u.'s as natural gas.

Gas Return Denied

BAKERSFIELD, Calif. — A suit seeking to compel operators in Paloma field, Kern County, to return all gas to the producing sands was denied in a Superior Court here last week. The plaintiffs, Pittsburg Oil & Gas Co., Barnsdall Oil Co., and others, had sought to partition the field because of failure of some operators to return the gas.

Superior Judge W. L. Bradshaw in refusing the partition, in effect ruled that such was not possible. He found that the operating agreement under which the field was jointly operated by the parties to the action constituted cotenancy and that the only means of partitioning the field is through a dissolution of the original operating agreement.

MEETINGS

IOCC Asks Crude Capacity

OKLAHOMA CITY. — The extent to which the United States can increase its production of crude oil to meet a military emergency will be surveyed by the Interstate Oil Compact Commission at its summer meeting in French Lick, Ind., August 3-5.

Gov. Roy J. Turner of Oklahoma, chairman of the commission, added this subject to the agenda in a telegram to all oil-producing states, which said: "We desire to ascertain the additional daily oil reserve producing ability of each state as of August 1 to meet any national emergency."

NEXT WEEK

Refining developments.—Ion exchange (or deionization), which has proven techniques in water conditioning, now promises new applications in treatment of petroleum fractions; articles by George Weber, the Journal's refining editor.

And an article on "Drum Reconditioning" as applied in new plant at the Watson, Calif., refinery of Richfield Oil Corp. The damaged drums are reconditioned at 100 per hour rate.

Production developments.—Report on Shell Oil's development, during past 2 years, of automatic control of producing operations. Shell now has installed nine fully automatic leases, operating on routine basis. Article by W. T. Nance and J. M. Payne, Shell engineers at Kilgore, Tex.

Drilling operations.—G. E. McClatchey, division engineer for Sunray Oil Corp., and who has been active with the former Barnsdall Co. in offshore drilling rigs, describes how a deep water "Sea Drill" rig has moved and drilled in water substantially shallower than vessel draft.

And Phil C. Ingalls, associate Journal editor, gives first-hand report on Sholem Alechem field, southern Oklahoma. An old timer, Sholem Alechem through deep drilling has jumped its production from 1,915 bbl. to over 16,000 bbl. per day in 2 years. There are 50 rigs now running.

Pipe lining.—Article on "spot" reconditioning of pipe line in place, while in service; by W. N. Johnson, Standard Pacific Gas Line, Inc.

LATIN AMERICA

Lube-Oil Plant

Venezuela's first facilities for making lubricating oils being added to Shell's Punta Cardon refinery

George Weber

A MODERN plant for producing a wide range of finished lubricating oils is now under construction at the new Punta Cardon refinery of Venezuelan Oil Concessions, Ltd. Addition of this new section at the 60,000-bbl. Shell refinery will provide Venezuela with its first lube-oil manufacturing facilities.

The new lube plant will be capable of producing from 2,000 to 2,500 bbl. of finished products per day. It is scheduled for completion during the second half of 1951.

The lube section will comprise the following units: a 2,560-bbl. per day deasphalting unit, a 6,350-bbl. furfural refining unit, a 3,520-bbl. solvent dewaxing unit, and a clay contacting unit capable of handling 3,700 bbl. of charge per day. Raw stock to the plant will be withdrawn overhead from the high-vacuum distillation unit operating in conjunction with the primary crude distillation unit charging light crude.

Augments refinery.—The new lube plant will augment the production of petroleum fuels which has been under way at Cardon for several months.

Cardon processes two grades of crude. Light stock, averaging 34° A.P.I. gravity, is charged to a crude-distillation unit with a design capacity for processing 38,000 bbl. per day. The unit comprises a primary atmospheric fractionation column and a secondary or vacuum column, and in addition, gasoline rerun and stabilization facilities.

Both the primary and secondary columns are provided with side-cut strippers for controlling the quality of the straightrun fractions. End products of the primary crude unit include refinery fuel gas, straightrun gasoline, naphtha, kerosine, gas oil, and a long residual fraction.

The latter, bottom fraction from the secondary column of the main crude unit is charged directly to a high-vacuum tower, which will produce side cuts of basic lubricating oil stocks and a short residuum. This vacuum unit is equipped with a caustic extraction system which will enable the handling of feed stocks containing naphthenic acid.

Operating details.—Heavy Venezuelan crude averaging 13° A.P.I. is charged directly to two identical thermal cracking units, each with a charge capacity for 11,000 bbl. per day. These U.O.P. Dubbs units produce gas, gasoline, gas oil, and a heavy cracked residue. In addition to the conventional reaction and high-pressure flash chambers, these units are equipped with low-pressure flash chambers. Operating at about 5 psi. these flashers provide an extremely deep flash of the cracked residue. Flashed distillate is recycled via the fractionating tower in each unit, through the cracking unit furnace.

A thermal reforming unit of conventional U.O.P. design upgrades straightrun naphtha and kerosine from the crude distillation unit, into motor fuel components. Light fractions from both the reformer and the twin thermal cracking units are charged to a gas-recovery unit.

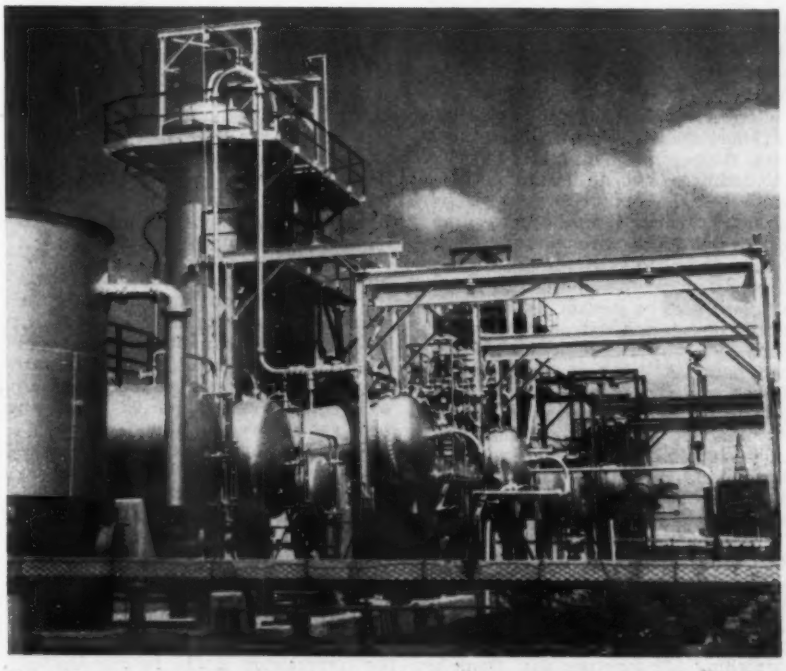
The gas recovery, or gas-tail, unit comprises a rectifying absorber, a stripper, and a gasoline splitter. Overhead from the absorber consists of dry gas, mainly ethane and lighter, used for plant fuel. Absorber bottoms are split in the stripper or debutanizer column. The overhead butane-propane mix is polymerization-plant feed stock. Debutanized gasoline is charged to the gasoline splitter. Bottoms, or heavy gasoline, is used as lean oil for the absorber. The absorber also employs a small section at the top of the column which admits cracked gas oil from the cracking units, as a "sponge oil."

Cracked fuel products from the two crude cracking units and the reformer are further processed in four treating units. The propane-butane mix is treated in the Shell phosphate treater for H_2S removal. Before charging to the poly plant the product is scrubbed with caustic for mercaptan removal.

The continuous mixing-settling type of soda treater gives the light gasoline overhead from the gasoline splitter a prewash with salt water before countercurrent contact with caustic soda for H_2S and mercaptan removal.

Heavy cracked gasoline withdrawn from the gas-recovery system is first charged to two identical sulfuric acid treaters. After countercurrent, two-stage mixing, and settling, the treated stock is redistilled to strip off polymers formed during the acid treatment.

Caustic soda.—Treated light gasoline, rerun, acid-treated heavy gasoline, and the gasoline side cut from the thermal reformer combine as charge to the doctor treater for production



The acid treating unit shown here is one of four treating units employed in desulfurizing cracked fuel products at the Cardon refinery.

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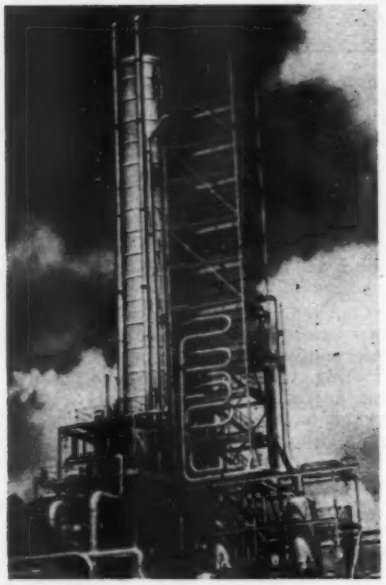

This high-vacuum unit at Shell's new Punta Cardon refinery in Venezuela will produce the vacuum distillate stocks for the company's extensive lubricating-oil plant, now under construction.

of a cracked gasoline blend stock. The conventional doctor treater employs a three-stage regenerator unit for recovery of spent doctor solution.

Utilities.—The steam generation plant at Cardon produces 500-psi. power steam for electrical generation in three high-pressure Babcock & Wilcox boilers, each with a capacity of 50,000 kg. per hour (110,000 lb. per hour). Process steam at 250 psi. is generated in four low-pressure boilers with aggregate capacity for 396,000 lb. per hour.

Four English 10,000-hp. condensing turbines drive 7,500-kw. a.c. generators, furnishing light and power for the refinery and the community of employes. The plant is highly electrified, practically all pumps and spares being electric powered.

Salt water is used for cooling and fire protection. When the lubricating oil plant goes on stream, total cooling-water circulation, on a once-through basis, will approximate 30,000 tons per hour. At present two electric-driven and two steam-turbine-driven centrifugal pumps, each with a capacity of about 6,000 tons per hour, circulate cooling water. One electric-driven and two diesel-driven pumps furnishing capacity for 15,000 tons per hour are installed for fire control.

Fresh water for process, boiler feed, and human consumption was until recently provided by a Vickers-Armstrong salt-water distiller of 1,100 tons per day capacity, and four Lummus salt-water distillers each furnishing 150 tons per day. Completion of the joint Shell-Creole-Venezuelan Government 30-34-in. pipe line now provides all fresh-water requirements at the plant. The 80-mile line moves water by gravity from the springs and wells near Coro on the mainland to the arid Paraguana Peninsula.

The lubricating-oil plant and several units in the fuels plant were designed by Lummus Co., which also contracted for the refinery construction. Raymond Concrete Pile Co. built the jetties and poured most of the concrete foundations in the plant. Tankage was erected by Whessoe, Ltd., and the balance of the construction of plant and community was undertaken by Shell and local Venezuelan contractors.

The refinery project occupies an area of 3,150 acres, with 4 miles of coastal frontage. The refinery proper occupies a relatively small area located down the prevailing winds from the employe residential areas. The employe community is designed for a population of 10,000.

Mexican Venture Starts

Pauley schedules actual drilling within the month; two structures get first test, two more to follow

Dahl M. Duff

EDWIN W. PAULEY plans to start immediate drilling, using two rigs simultaneously in northern Mexico, under his new percentage-of-production contract with Petroleos Mexicanos, the Mexican Government oil agency.

Pauley told The Oil and Gas Journal last week that he expected to get under way with actual drilling operations within a month. Drilling will be done under a contract not yet let.

Structures on which the initial drilling will be undertaken are Trevino and Lomitas. Two others which will be tested later are Nogales and Santo Domingo. All are just south of McAllen, Tex., and are on the El Frio-Vicksburg trend.

Trevino is next to the border and to Brazil field which produces gas and distillate. Lomitas is slightly west of Reynosa. The other two structures are south and east.

Geophysical work has already been carried out in the area, and Pauley was optimistic over the possibilities of obtaining production. Independent Exploration is carrying out the operation. This is a joint venture in which Pauley is the operator and in which he holds controlling interest.

Same terms given.—Terms of the contract, Pauley said, are virtually the same as those obtained last year by Mexican American Independent Oil Co. (CIMA) for drilling in southern Mexico. There is a 12-year term in which to develop and 25 years in which to recover.

Expenses are borne by the operator until production is obtained. Pemex then pays the operating expenses, and the operator recovers his capital expenditures from 50 per cent of the production. In addition, he receives an additional 15 per cent of the oil and 18 per cent of the gas as compensation. The oil is taken in kind or in cash at a price equivalent to that for comparable crude in the United States.

Pauley said the terms were the same as those in the CIMA contract except for some clarifications and minor improvements, which inure to the benefit of the CIMA arrangement.

The new contract with Pauley and a similar drilling arrangement with the Sharples interests were announced originally in Mexico City by Pemex *(The Oil and Gas Journal, July 27, page 165)*. The Sharples contract covers two sizable areas west and south of the Golden Lane in Vera Cruz.

Sharples' plans for drilling are as yet indefinite. Geological and geophysical data already accumulated on the area will be studied, and further plans made on this basis. The areas involved are wildcat territory. The operation will be the first venture for the Sharples organization in Mexico; terms of its contract are the same as those for CIMA and Pauley. The subsidiary Sharples Oil Corp., Denver, now has extensive operations in the Southwest and the Rocky Mountains.

Testing lower sands.—In the CIMA operation in southern Mexico, Tortuguero 1 is being deepened for the testing of lower sands. This well is a 40°-angle hole on the beach east of Puerto Mexico in Vera Cruz. It was spudded last October, went to 6,302 ft., and was listed as a completion good for 150-200 bbl. daily since the well sanded up when production was increased. A different liner is to be set in the well.

Tortuguero 2, an angle hole offsetting No. 1, was spudded in February. It was completed in the shallower zone. The well is closed in until the gas can be shut off. It is rated at about 300 bbl. daily, producing about 27°-gravity oil in comparison to the 35°-gravity in the No. 1.

Xicalango 1, the Campeche well drilled by CIMA on a point of land west of the entrance to Laguna del Carmen opposite Ciudad Carmen, has shown extremely high pressure of about 7,500 psi. Pauley said it was felt that Xicalango had not been properly tested by the present capacity rig being used there. If only

dry gas is obtained, plans are to move the present rig to Tortuguero, and bring a National 100 to Xicalango. A National 50 is to be brought in to develop the shallower zones at Tortuguero. This would give a total of four rigs operating for the CIMA group in southern Mexico.

Lagoon operation. — The Xicalango well is a lagoon operation for which the contract allows 16¼ per cent of production for compensation. The Tortuguero wells, as offshore holes, provide for 18 per cent of production as the compensation interest to the operator.

Pauley disclosed that he has been interested for some time in the possibilities of utilization of natural gas presently shut in or being flared in Venezuela. He has had two engineers recently in New York studying the matter, but added that it is a long-range project as yet in a tentative and preliminary stage. He spoke of the possibilities of using Venezuelan gas in chemical manufacture.

The drilling by Pauley in northern Mexico under his new contract is in the state of Tamaulipas. In the southern part of this state, Pemex has drilled to date five wells under a financing arrangement with Cities Service Oil Co. This work has been carried out since April 1948. It is on about 1,300,000 acres of undeveloped land on which Cities Service held rights before expropriation. No commercial production has resulted from this drilling, thus far, but geophysical work is continuing.

El Mene Deep Test

B.C.O. gets shows in try for Cretaceous

PROMISING shows of high-quality light oil have been encountered in the El Mene deep test of British Controlled Oilfields, Ltd., in Venezuela, but the well is being taken down to the Cretaceous limestones, the original objective.

The test, spudded in last August 18, is located on B.C.O. concession northeast of Lake Maracaibo in the State of Falcon. As the first deep test in that part of Western Venezuela, it is being watched with considerable interest.

Results thus far with the well were disclosed recently in London in the annual statement of Lt. Col. Sir G. Owen, B.C.O. president. Oil and gas shows, he said, were encountered from 8,550-80 ft., and even heavier from 8,686-98 ft. There were continuous oil shows from 8,878-94 ft. and at high pressure from 8,930-61 ft.

Late in April, he said, drilling was suspended for several weeks at a depth of 10,451 ft. Drilling has now been resumed. The suspension was due to a mechanical breakdown necessitating replacement parts from the United States.

Company outlook.—B.C.O. at present has shallow production in the El Mene-Hombre Pintado area. Through the subsidiary Ecuador Oilfields, Ltd., it produces in Ecuador. However, the president's statement indicated that much of the future prospects for company rest on the current deep exploration. The shallow Venezuelan production at El Mene is being maintained by added pumping equipment.

The Ecuadorean operation lost money last year. Crude production dropped about 16 per cent to approximately 1,450 bbl. daily. This was attributed to the fact that production from new wells failed to offset the decline of the older wells and also to the disappointing results of exploratory drilling.

The Ecuador Oilfields production is from El Tigre and El Cautivo fields. During the last 6 months, new pumping equipment has halted the decline from the proven areas, and the present program calls for two medium-depth exploratory wells with two other rigs employed on field drilling.

About 43 per cent of the Ecuadorean production is refined in a small topping plant and sold locally. The outlook for marketing in Ecuador improved late last year when the government authorized a products price increase after protracted negotiations.

New Trinidad Buyers

Buying functions for Trinidad Leaseholds, Ltd., formerly carried out by the American subsidiary, Trinidad Leaseholds (New York), Inc., have been taken over by Bill Foster Associates, Inc., Sparta, N. J.

Foster Associates has been appointed purchasing agents in the United States and Canada for Trinidad Leaseholds, and W. H. Busold, formerly with Trinidad Leaseholds (New York), has been named general manager for Foster. Trinidad Leaseholds (New York) continues with marketing, personnel, and other administrative matters under the direction of T. C. Wiedenman. Its office was recently moved to a new location at 551 Park in New York City.

South Peru is Oil Prospect

A commission of geologists is being organized by the Peruvian Government to study the oil possibilities of an area in the southern part of the country.

The government in Lima was recently advised of the presence of a filtration (seepage) in the Bay of Pisco in southern Peru. In view of this and the fact that geological studies previously made by the government have shown indications of oil, the government has authorized the Oil Bureau to appoint the investigating commission of geologists in cooperation with Empresa Petrolera Fiscal, the government's oil agency.

EUROPE

Supply Problem

British equipment suppliers expect big gain in business

BESIDES meeting the continuing requirements of the British oil companies themselves, the oil-equipment industry in the United Kingdom is now faced with the problem of finding capacity to handle the requirements of United States companies purchasing in the sterling area as a result of recent agreements with the British Government, E. F. E. Howard, chairman of the Council of British Manufacturers of Petroleum Equipment, said at the council's recent annual meeting.

There are no signs of any letting up in pressure of requirements on the part of the British oil companies, Howard told the group. "Some of you may have looked with concern at the recent statistical information published by the Oil Companies Materials Committee" (see table), he said. "These figures represent orders placed by certain — some 40-odd— British oil companies for equipment to be used abroad and they show nothing of the activity devoted to the home market; neither do they include purchases by the U. S. purchasing agents in this country."

Howard pointed out to the group that G. H. Coxon, Anglo-Iranian Oil Co., Ltd., official, had said recently in a speech in London that the British equipment industry had an opportunity handed to it because of the necessity of certain American companies to buy non-dollar equipment. Howard urged the equipment manufacturers to maintain advertised delivery time and to correct any faults known to exist in their products.

"Here we are handed an opportunity which we will only grasp if we are quite certain that the material we are producing is right and satisfactory to the U. S. user," Howard said. "They are going to be even more critical of materials coming from this country than the British - controlled oil companies."

T. L. Bonstow, the council's technical adviser, discussed standardization work. He also recommended that the British manufacturers give more attention to the corrosion problem. He said there was great interest in the question of spare parts for American oil companies and that there is equipment idle abroad for lack of such parts.

Howard's report included figures from the Materials Secretariat of the British oil companies showing that orders placed for materials and equipment manufactured in the United Kingdom for shipment to the British petroleum industry overseas during the first quarter of 1950 amounted to £12,039,000 (equivalent to $33,709,-

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000). This represents a £12,417,000 decrease from the previous quarter. The breakdown on these orders follows:

Classification—	First quarter 1950
Machinery	£881,000
Plant	494,000
Drilling and production plant and tools	731,000
Automotive equipment	728,000
Electrical machinery and equipment	672,000
Highly manufactured equipment	1,028,000
Equipment not elsewhere specified	209,000
Fabricated steel	749,000
Finished steel products	3,865,000
Nonferrous metals	207,000
Chemicals	986,000
Nonmetallic minerals and products thereof	376,000
Timber	33,000
Other raw materials and products thereof	1,080,000
Total	£12,039,000

The total of such orders for the year 1949 was £63,836,000, for the year 1948 £61,070,000, and for the year 1947 £46,777,000.

French Field Grows

New wells, new records encourage oil outlook

BASED on the results of the few wells drilled thus far, the Lacq area in southwestern France appears to be shaping up as an oil field of some importance.

Reports are that the field has been recently producing about 1,900 bbl. daily. This has almost trebled the indigenous production in France, raising the daily average to the highest point in the country's history.

Four rigs are reported to be now running in the area. The No. 3 well was completed several weeks ago with a production of about 700 bbl. daily.

Development of the field has given considerable encouragement to the French oil exploration program. The French Bureau de Recherches de Petrole has been preparing a second 5-year plan for petroleum exploration, and the Economic Cooperation Administration recently provided assistance in the purchase of additional drilling equipment.

It is anticipated that Standard Francaise des Petroles, the Standard Oil Co. (N. J.) affiliate in France, will receive a concession covering a large area around Bordeaux, before the end of the year. Communist opposition is credited with having held up favorable action by the government on the company's long-pending application.

Road to Bayonne. — The first Lacq well came in late last year. The operator is Soc. Nacionale des Petroles d'Aquitaine, one of several partly government-owned companies carrying out exploration in France and its African territories. Lacq is some 24 km. west of Pau on the main road to Bayonne. It is in the foreland of the Pyrenees in the Department of Basses-Pyrenees.

The second well confirmed the discovery results and indicated the presence of a fair-sized oil field. The structure is a dome which was outlined by reflection seismograph.

The No. 2 well came in April 23 with an initial production, apparently open flow, of about 360 cu. m. daily (about 2,250 bbl. daily). Tested on chokes ranging up to 1 in., the well showed at a maximum rate of 45 cu. m. an hour, or about 7,700 bbl. daily.

The production is from Upper Cretaceous limestone at 615 m. (2,020 ft.). The top of the structure was at 570 m. (1,870 ft.). Seismic work indicates other similar structures to the south and east of Pau. The drilling plans include testing of the Lower Cretaceous formations in the area.

French crude production hitherto has come from the old Pechelbronn field in the Alsace basin near the German border. Production in this field is planned at about 1,400 bbl. daily for 1950. Prior to the Lacq discovery, various other French wildcats showed indications of oil but nothing of major significance had been developed.

Shell Haven Expands

Erection of the reforming column was scheduled to get under way last week at the Shell Haven refinery of the Shell organization in Essex, England.

The unit is a part of the expansion of this refinery to a capacity of about 40,000 bbl. daily. With the enlarged refinery at Stanlow, Cheshire, and the Heysham plant, Shell processing capacity in the United Kingdom will be brought to about 130,000 bbl. daily by 1952.

Offshore Rights

United Nations defines continental-shelf law

THE right of a country to control and develop mineral resources of the sea bed outside its own territorial waters has been confirmed by the International Law Commission of the United Nations.

Findings of the commission in regard to the legal aspects of continental-shelf development were announced recently in Geneva where the commission has been meeting. Its work is of interest to the petroleum industry in view of offshore operations in the Persian Gulf, the United States Gulf Coast, and elsewhere.

The United Nations commission formulated three principles for mineral development offshore. They are:

1. Control and jurisdiction over the sea bed and subsoil of submarine areas outside the marginal sea may be exercised by littoral states for the exploration and the exploitation of the mineral resources therein contained. The extent of such an area will need definition, but it need not depend on the existence of a continental shelf.

2. Such control and jurisdiction must not substantially affect the right of free navigation of the waters above such submarine areas, nor the right of free fisheries in such waters.

3. The submarine area (sea bed and subsoil) of the continental shelf off the coast of a littoral state and outside its territorial waters is subject ipso jure to the control and jurisdiction of the littoral state.

Executive proclamations have in several cases extended national control to continental-shelf minerals. This action was taken several years ago by President Truman for the United States; and control has been similarly extended by governments bordering the Persian Gulf.

The subject of control of continental-shelf minerals formed a major part of the study of the United Nations commission on the general matter of the regime of the high seas. Development of mineral resources, principally oil, in continental-shelf areas raised a point completely uncovered by international law or commonly accepted practice. Previously, high seas outside territorial waters legally were regarded as open to all, primarily for fishing and communications.

Findings of the United Nations commission must be submitted to the U.N. General Assembly for approval. Russia and Czechoslovakia have been boycotting the International Law Commission meetings because of the presence of a Chinese Nationalist representative.

FAR EAST

Oil Found in Pakistan

The Pakistan Embassy in Washington reports that oil has been found in the Patharias Forests, recently awarded to Pakistan by the Bagge Boundary Tribunal, and that extensive deveopment will be carried out with a view to developing a production of 3,000 bbl. daily.

Arrangements have been completed between the government and Burmah Oil Co., for drilling in the area, and the company already has moved in considerable equipment from Karachi, it was said. Burmah has formed a Pakistani company and has applied for oil concessions in various parts of the country, including the Patharias Forests and Baluchistan.

A refinery will be set up in the Patharias area within the next 3 years after production of oil has been brought to a commercial level, the embassy said.

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PERSONALS

Steps Up

Banks named president of California gas firm

F. M. BANKS has been appointed president of Southern California Gas Co., succeeding F. S. Wade, who becomes chairman of the board of directors.

Banks has spent practically his entire business career with the company, having joined the firm in 1922 shortly after completing his education.

A native of Los Angeles, he obtained a B.S. degree in electro-chemical engineering at Colorado School of Mines and then took special work in business administration at Massachusetts Institute of Technology. Upon joining Southern California Gas Co. he performed sales work in San Bernardino and in the San Joaquin Valley. In 1930 he was made general superintendent of sales and in 1934 he became a vice president. He became general manager a year ago, after serving a year as assistant general manager and vice president.

A past president of the Pacific Coast Gas Association, Banks long has been active in gas-industry affairs. Currently he is a director of American Gas Association and is a member of the board of trustees of the Institute of Gas Technology, Chicago.

F. S. Wade, president, and **LeRoy M. Edwards,** vice president and special counsel, of Southern California Gas Co., Los Angeles, have resigned and will retire under the company's pension plan. Wade has been elected chairman of the board of directors, and Edwards will continue as a director. Edwards also resigned as vice president and general counsel for Southern Counties Gas Co., and as vice president and general manager of Pacific Lighting Gas Supply Co., both affiliates of Southern California Gas. **F. M. Banks** succeeds Wade as president of Southern California Gas. Wade will continue to be available to the firm in an advisory capacity, and Edwards will be retained a special counsel of the two affiliates. Other changes within Pacific Lighting Gas Supply Co. include: **Robert A. Hornby,** elected executive vice president; **Marion L. Fort,** former general superintendent, elected vice president and general superintendent; **C. E. Pearman,** former treasurer and controller, named vice president and treasurer; and **Raymond W. Todd,** chief engineer, elected to the board of directors.

F. S. WADE

L. M. EDWARDS

James W. Templeton has been named general auditor of The Texas Co., Houston, succeeding **B. E. Emerson,** who retired on August 1 after 43 years of company service. **C. N. Ferguson,** special auditor, has been named assistant general auditor.

Dan Kralis has been retained by Robinson Brothers, Borger, Tex., oil producers, as a consulting geologist in charge of exploration facilities. Headquarters for the firm's exploration headquarters have been established in Abilene, Tex. Kralis formerly had offices in Snyder, Tex.

L. S. Wescoat, president of Pure Oil Co., has been named to the chairmanship of the newly activated special committee on storage capacity, National Petroleum Council. **Russell B. Brown** of Independent Petroleum Association of America heads a similar new committee on steel requirements.

Howard P. Ferguson, who heads the refinery-control division of the Standard Oil Co. (Ohio) manufacturing department in Cleveland, was recently included in a group of American scientists receiving awards of merit from the American Society for Testing Materials. Ferguson has long been active on the A.S.T.M. Committee D-2 on Petroleum Products and Lubricants.

Marshall E. Parker, corrosion engineer for Cathodic Protection Service, has resigned and has opened an office in Houston as a consulting corrosion engineer. He formerly was with Pan American Pipe Line Co. and Houston Lighting & Power Co. before joining Cathodic Protection.

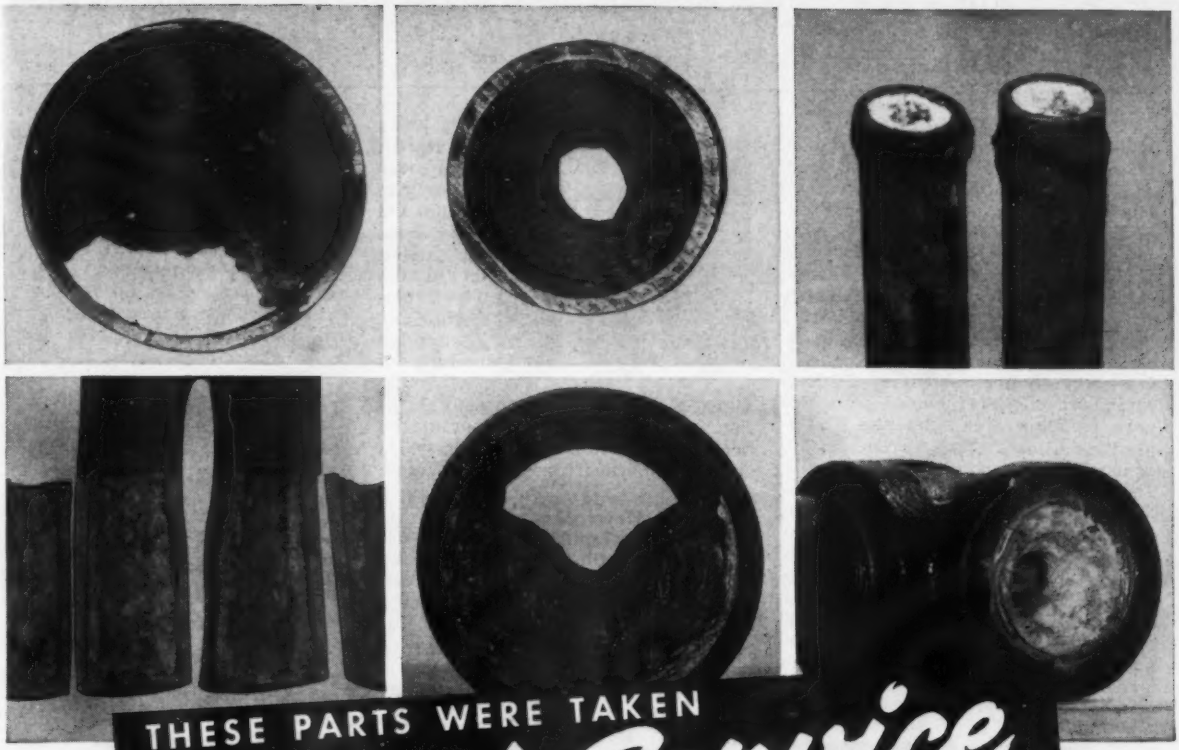
J. C. Crawford, Denver, has been named district secretary of the newly organized Mountain States District, Liquefied Petroleum Gas Association. He is a former executive vice president of Colorado Liquefied Petroleum Gas Association.

Ray Fickel, geologist for Sinclair Oil & Gas Co. at Amarillo, Tex., has been transferred to Houston, and has been succeeded in Amarillo by **Don Gibson.** Gibson's former position will be filled by **Corwin Smith,** transferring to Amarillo from Houston.

C. G. Dickinson, Forest Oil Corp., San Antonio, has been elected secretary of the South Texas Geological Society, replacing **Keith L. Rathbun,** who has moved to Houston to become chief geologist for Continental Oil Co.

Basil R. Jackson, a director of Anglo-Iranian Oil Co., Ltd., and formerly the company's representative in the United States, has been appointed deputy chairman. He succeeds **Sir H. B. Heath Eves** who resigns as deputy chairman and managing director but remains on the Anglo-Iranian board. Jackson was in charge of the New York office for a total period of about 15 years. He remained as United States representative until December 1, 1949, when, after joining the board as director, he returned to London permanently. He joined the company in 1920 after World War I service and, before opening the New York office in 1930, was engaged in various company activities in London and in Iran.

T. D. Stewart, formerly district gager for Humble Pipe Line Co. at Odessa, Tex., has resigned to enter private business. Other changes in Humble's Odessa division include: **Theodore R. Huestis,** named district gager and transferred from Odessa to Andrews, Tex.; **Francis E. Gleaton,** gager at Notress, Tex., named district gager at Oil Center, Tex.; **William H. Caudle,** district gager, moved from Oil Center, Tex., to Hobbs, N. M.; **Marvin E. Franks,** gager at Andrews, Tex., transferred to Notrees as district gager; **J. H. Burnett,** and **Fred W. Reeves,** both named district gagers and transferred from Sonora, Tex., to Odessa; **Jack W. Westerfield,** assistant gager, transferred from Odessa to Notrees; **Theodore R. Mauck,** assistant



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PERSONALS

gager, moved from Odessa to Hobbs; **G. Blake,** engineer, transferred from Jal, N. M., to the Eckert station on Humble's new crude line near Fredericksburg; **Robert E. Clark,** engineer, moved from Odessa to Jal; **Henry L. Caldwell,** engineer, transferred from Odessa to the Eckert station; **Charlie N. Underwood,** engineer, moved from McCamey, Tex., to Odessa; **John R. Saunders,** engineer, transferred from Odessa to Sonora; **William C. Holcomb, Jr.,** engineer, moved from Sonora to Wink, Tex.; **Sterling E. Eggleston,** Odessa, transferred to the producing department at Penwell, Tex.; and **Benjamin E. Willard,** production, Sonora, transferred to Odessa.

Floyd O. Brett, division production superintendent for Sinclair Oil & Gas Co. at Fort Worth, has been named assistant general superintendent, with headquarters in Tulsa, and will work under **F. H. Rhoes,** general superintendent, who has charge of all company producing properties. **Walter T. Crandall,** assistant division superintendent at Midland, Tex., will succeed Brett at Fort Worth, and **Joseph B. Kennedy,** formerly division engineer at Tulsa, will succeed Crandall as assistant division superintendent at Midland. Brett joined the company in 1929, and has served in various capacities in the producing department. He was named assistant division superintendent at Fort Worth in October 1949. Crandall has also been with Sinclair since 1929, working in the production department in Oklahoma, Kansas, and Texas. He was named assistant division superintendent in Midland in November 1949. Kennedy, who joined Sinclair in 1935 as a geological scout, has served in various geological and engineering capacities.

F. O. BRETT

W. T. CRANDALL

Godfrey L. Ladd has been appointed in charge of operations of the new 75,000-gal. lube-oil plant at Lima, Ohio, refinery of Standard Oil Co. (Ohio). **Peter Enting,** formerly supervisor of the yield and utilities unit at Sohio's No. 1 refinery in Cleveland, has been named assistant office manager, succeeding **Frank Hart,** now manager.

Willis W. Hardy, chief geophysicist since 1939, of Socony-Vacuum Oil Co., Inc., has been appointed assistant chief of the company's exploration division. Hardy attended the University of Chicago and joined the Socony-Vacuum organization in 1938. He is a member of the Society of Exploration Geophysicists and the American Geophysical Union.

John B. Howard, manager, marine department, Standard - Vacuum Oil Co., **Edwin L. Stewart,** director, Esso Shipping Co., and **Aristides Onassis,** Olympic Oil Lines, have been elected to membership in the American Bureau of Shipping, New York.

E. Clyde McGraw, Houston, has been elected vice president of Transcontinental Gas Pipe Line Corp., and has assumed his new duties in charge of operations for the Texas-to-New York City natural-gas line. A graduate engineer from the University of Nebraska, McGraw formerly was vice president of Stone & Webster Service Corp.

W. L. Ambrose, formerly with Interstate Oil Pipe Line Co., is now with Cities Service Oil Co.'s Fort Worth division, where he is serving as representative in the crude-oil supply and transportation department.

Byron O. Sims, Jr., petroleum engineer at Lake Charles, La., for Magnolia Petroleum Co., has been transferred to Healdton, Okla., in that capacity.

William B. Smith, superintendent of Husky Oil Co.'s land department, has been transferred to the company's newly opened district office in Midland, Tex., where he will be in charge of exploration activities in West Texas and New Mexico. Smith formerly was with Phillips Petroleum Co., and joined Husky following service in the U. S. Navy. He formerly served in Husky's Cody, Wyo., office before his transfer to Midland.

Martin Manders, refinery engineer for Union Oil Co., Los Angeles, has returned from Japan where he served as an adviser for Maruzen Oil Co., Ltd., during the reconstruction of its Shimotsu and Matsuyama refineries.

Don W. Conaway, district petroleum engineer of the Michigan district for Ohio Oil Co. with headquarters in Grand Rapids, has joined British-American Oil Producing Co., Tulsa, as district engineer for the Central district, which includes Kansas, Oklahoma, and Illinois. He will be headquartered in Oklahoma City. **Fred A. Norris,** formerly Central district engineer at Oklahoma City, has been transferred to Seymour, Tex., as southwestern district engineer, covering North and West Texas, the Texas Panhandle, and New Mexico. **D. W. Holder,** chief accountant at Tulsa, has been transferred to the Calgary, Alta., Canada, staff of British American Oil Co., Ltd., where he will serve as assistant controller in the production-accounting division. Conaway is a graduate of the University of West Virginia, and had been with Ohio Oil since 1944. Norris has been with British-American since 1944, and formerly was a plant chemist for The Texas Co. Holder joined the firm in 1936.

D. W. CONAWAY

F. A. NORRIS

H. W. Camp, manager of the refining division of Cities Service Oil Co. (Del.), Bartlesville, Okla., will retire from active service on September 1, after more than 30 years with the company. Nationally recognized as an authority on refinery construction and operation, Camp is also a member of the board of directors of Cities Service. He joined the firm in 1917. While retiring from active service, Camp will, however, serve the company in an advisory capacity.

Joseph R. Horrigan, vice president of Oklahoma Contracting Corp., Houston, and a former Tulsan, has been reported missing in the New England mountains, along with three other persons, since July 20. The quartet was en route via plane from Teter-

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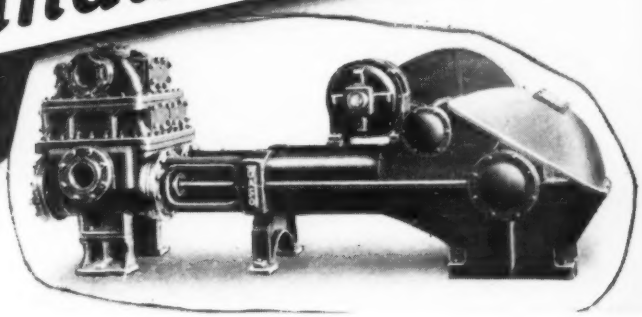

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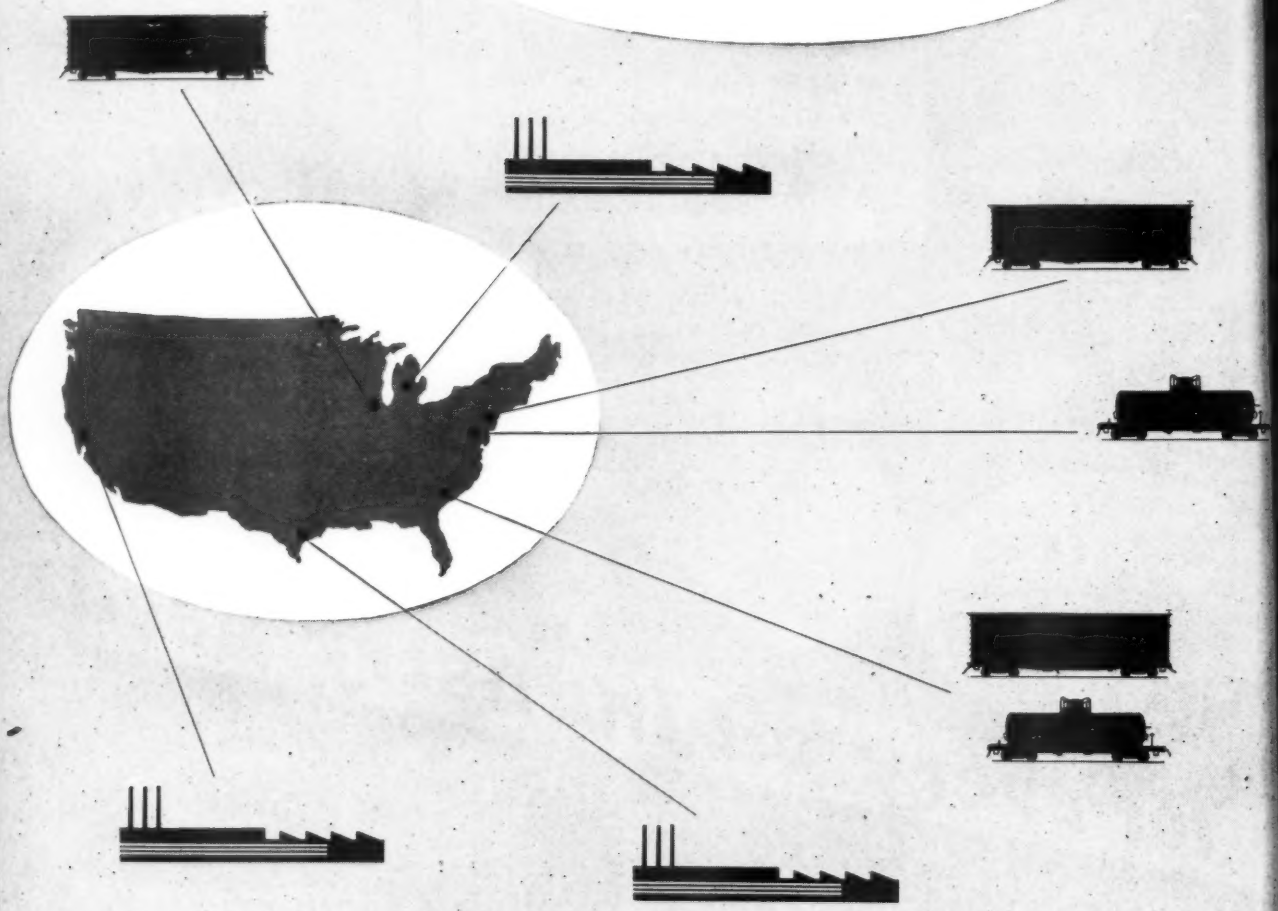

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boro, N. J., to Providence, R. I., Portland, Me., and Montreal, where Horrigan was scheduled to make an inspection trip.

D. E. Luddeke, district mechanical engineer, West Texas division, Pan American Pipe Line Co., Houston, has been named division foreman. **P. E. Hayes,** district gager in the southern division at Alvin, Tex., has been named division gager and transferred to the West Texas division, with headquarters at Snyder; and **E. W. Kearns,** mechanical engineer, has been named district mechanical engineer, northern division, with headquarters in Longview, Tex. Luddeke previously has been working as project engineer on construction of pumping-station facilities at Colorado City, Tex.

Kenneth Davison, petroleum engineer for James A. Lewis Engineering at Robinson, Ill., has moved to Casey, Ill., as an independent.

Glenn C. Thrasher, consulting geologist, Denver, has moved to Wichita, Kans., where he will be associated with Drillers Gas Co.

C. L. Robinson has been appointed assistant division supervisor of traffic and transportation in Gulf Oil Corp.'s newly created Fort Worth division production office.

F. W. Bell, area geologist, Shell Oil Co., Houston area, has been transferred to the company's regional staff in Houston.

E. Huguenin, chief deputy supervisor of the California Division of Oil and Gas at Los Angeles, will retire September 1 after 35 years of service. He will be succeeded by **H. V. Dodd,** who currently is supervisor of the Bakersfield offices.

John T. Hollingsworth has been named assistant general production superintendent of Signal Oil & Gas Co., Los Angeles, to succeed the late Harry C. Meyer. Hollingsworth formerly was superintendent of the company's operations in the Santa Maria area. **Willis E. McCullough,** production foreman in the Santa Maria area, will assume the position vacated by Hollingsworth.

Frank Forsyth has been named operations superintendent of production and drilling, Western division, for American Republics Corp., with headquarters in San Angelo. **A. L. Beesley,** formerly field superintendent at Hull, Tex., has been transferred to San Angelo as foreman for the West Texas division.

Dr. John C. Calhoun, Jr., chairman of the school of petroleum engineering at the University of Oklahoma, has resigned to take over as chief of the petroleum and natural-gas division at the school of mineral industries, Pennsylvania State College. He will assume his new duties at Penn State on Septemper 1. Calhoun is prominently identified in the petroleum industry as a leader in reservoir engineering developments and has written extensively on this subject for The Oil and Gas Journal in its weekly series "Engineering Fundamentals." This summer Dr. Calhoun is engaged in consulting work for Sohio Petroleum Co. at Oklahoma City.

E. M. Benson, development engineer at Taft, Calif., for Richfield Oil Corp., has been named production engineer at Los Angeles.

Robert C. Musa, Carle Place, Long Island, N. Y., has been awarded a $2,000 fellowship at Columbia University by Socony-Vacuum Oil Co., Inc. He will work for a doctorate in surface chemistry.

Howard D. Henderson, assistant manager of Sohio Petroleum Co.'s land and exploration department, has been named manager succeeding **George S. Buchanan,** now a vice president. Other changes include **W. W. Brown,** district geologist, Abilene, Tex., named staff geologist; **W. M. Wilkinson,** named district geologist at Abilene; and **Frank Johnson,** district landman in the Houston district, named to the same position in the Abilene district.

Charles H. Jones, who joined The Texas Co. in 1929 as a rate clerk and since 1946, assistant to the traffic manager in New York, has been appointed assistant traffic manager of the company.

V. R. Lay, tool pusher for Wheless Drilling Co., has been transferred from Jacksboro, Tex., to Haynesville, La., in the same capacity.

Alton P. Hynes, district manager for Shell Oil Co. at its Long Beach offices, has been appointed chairman of the petroleum division of that city's Community Chest.

Robert S. Dahlberg, Jr., group leader and reservoir analyst for Creole Petroleum Corp. at Caracas, Venezuela, has returned to the United States, and is now with Philco Corp., Philadelphia, studying microwave-relay problems.

SHIFTS

E. B. Harry, Jr., engineer, Sohio Petroleum Co., Pauls Valley to Edmond, Okla.; **Ward Stennett,** superintendent, Rocky Mountain Drilling Co., San Fernando to Camarillo, Calif.; **Paul J. Sharon,** engineer, Phillips Petroleum Co., Odessa, Tex., to Shidler, Okla.; **Russ Williams,** superintendent, Exploration Drilling Co., Odessa, Tex., to El Reno, Okla.; **J. E. Shafer,** superintendent, Big Chief Drilling Co., Natchez, Miss., to Kilgore, Tex.; **W. C. Posey,** superintendent, Zephyr Corp., Pauls Valley to Enid, Okla.

DEATHS

Col. James W. Flanagan, 77, former official in the Standard Oil Co. (N. J.) organization who is given major credit for construction of the 335-mile De Mares-Cartegena crude-oil pipe line in Colombia, died July 24 in Houston. Flanagan served the company in Mexico and later went to Colombia where he negotiated the original concession for the Andian National Corp., Ltd., line in 1923. He was president of the Andian National company until his retirement several years ago.

Hall Edwards, Evansville, Ind., oil man, died July 15.

Claude C. Best, 66, Wewoka, Okla., field engineer for Tretolite Co., died July 22.

Homer Larkin Chapman, 44, Tulsa, employe-relations supervisor for Stanolind Oil & Gas Co., died July 27. He had been with the firm since 1944.

Newell Sanford Bote, 50, Monroe, Ga., district foreman for Transcontinental Gas Pipe Line Corp., died July 14. He formerly was with Natural Gas Pipeline Corp. of America at Reynolds, Ill.

J. Knox Culton, 58, pioneer Nueces County, Texas, oil operator, died July 18 at Corpus Christi.

John Edward Morris, 88, formerly Dallas manager of Waters-Pierce Oil Co., later with Gulf Oil Corp., and an independent operator before retirement, died in Dallas July 21.

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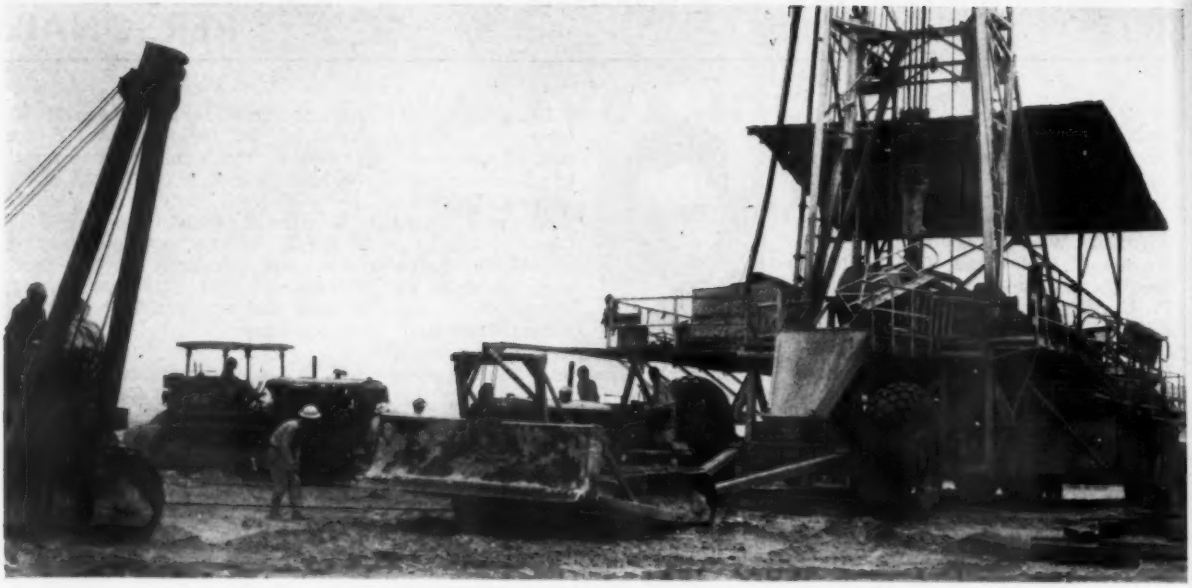


Drilling rig being moved by Aramco's large-tired dolly equipment in connection with workover operations.

Abqaiq — World's Largest Producer

Operated by Arabian American in Saudi Arabia. This is first of a series of articles from a Journal editor, recently visiting Middle East oil activties.

by Paul Reed
Pipe Line Editor

PRODUCING now at the rate of 450,000 bbl. daily, Abqaiq field of Arabian American Oil Co. is furnishing more oil than any other field today. For the next few months it will continue to produce this volume for meeting the company's market requirements, and for the filling of the 1,068-mile, 30 and 31-in. trans-Arabian pipe-line system. The latter will require 5,600,000 bbl. before the end of the year, to permit commencement of deliveries to tanker at Sidon, on the Mediterranean. Total Aramco production from all fields including Abqaiq will be close to 500,000 bbl. per day for the next 6 months.

For a long time East Texas field in the United States held the record as the world's largest producing field. East Texas currently is producing about 282,000 bbl. daily from approximately 22,340 wells. (Back in the period 1933-1939 production varied from a high of 1,230,000 to 500,000 bbl. daily.)

The efficiency and economy of Aramco's reservoir engineering for Abqaiq, now the world's No. 1 oil field on a production basis, is apparent from the fact that no more than 65 wells have been drilled, and that current production there is coming from 45 wells. However, 60 of the wells at Abqaiq are regarded as producible while 5 are observation wells. For years to come Abqaiq no doubt will be the stellar oil reserve of Aramco and consequently the major source of oil to be transported through Tapline.

The development of Abqaiq field in the 9 years following discovery in 1941 has called for extensive construction of camp, shop, and plant facilities both in the main base at Dhahran and on a somewhat smaller scale at the Abqaiq field establishments. These include power plants, water works, ice plants, machine shops, warehouses, commissaries, hospitals, schools, and provisions for numerous recreational activities. Both Dhahran and Abqaiq central air-conditioning plants serve offices, houses, and other buildings.

A 30-mile road connects Abqaiq field with Dhahran, the company town located in the 75,000-bbl. per day Damman field discovered in 1936 . . . the first field developed by Aramco.

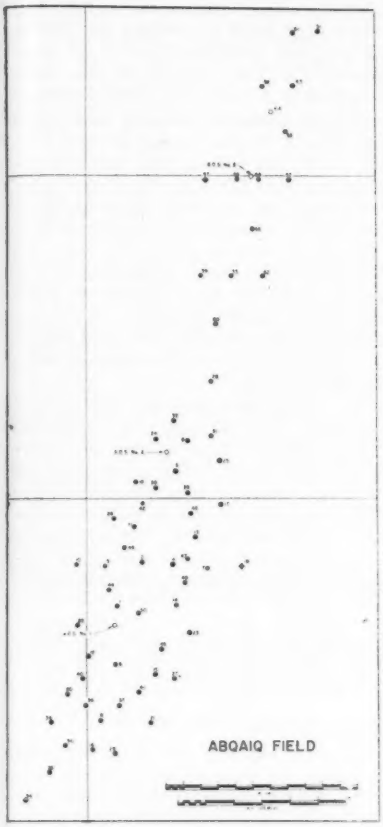
These large-scale auxiliary facilities representing substantial investments have been undertaken with prolonged advanced planning and courageous aggressive management. To maintain Americans and Arabs, together with personnel of other nationalities, under desert conditions on the other side of the world, Aramco has exerted careful, far-sighted concern for the details of transportation, working, living, education, and recreation of its employes.

Details of Fields

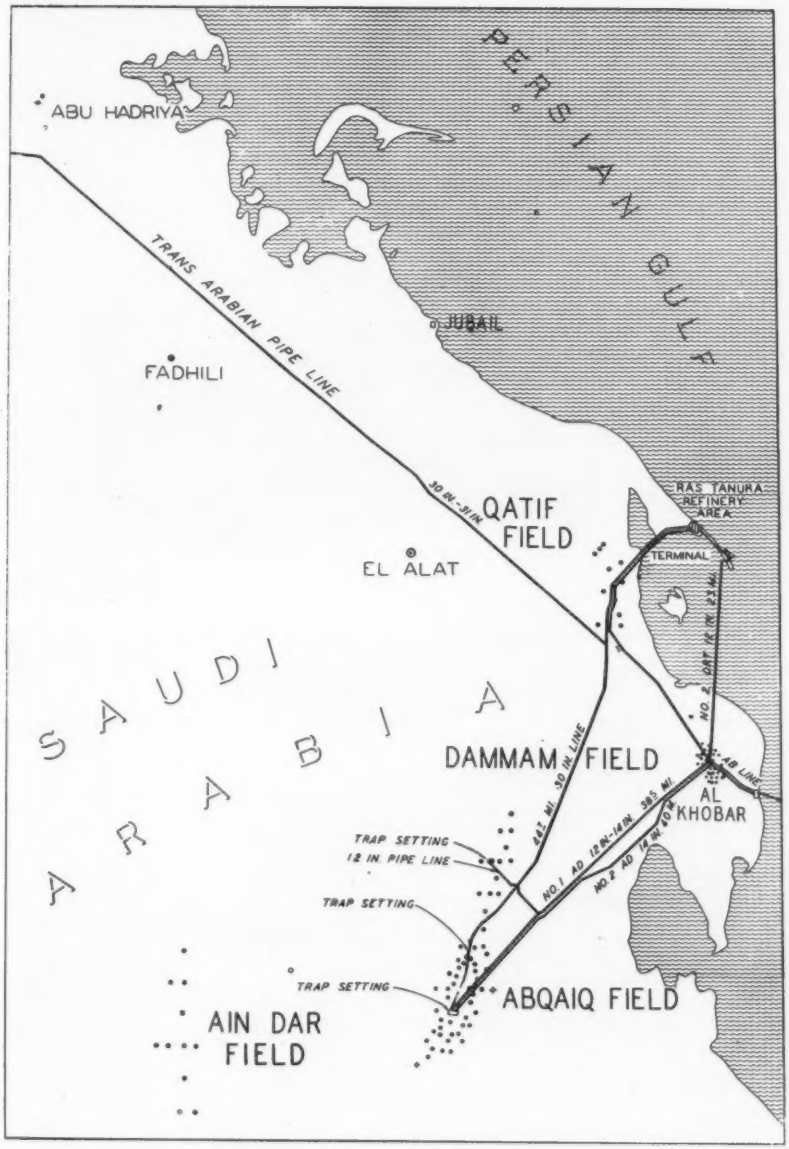
Abqaiq field is 30 miles long and 6 miles wide, although average width is 3 miles. Nearly all the production, 38° A.P.I., comes from the Arab D member of the Arab limestone formation. There is some lower-gravity, 33° A.P.I., from 6,000 to 6,200 ft. in Arab C. There is no production from A and B. Abqaiq reserves have been estimated by engineers of the industry as 4 billion barrels.

A major concern of Aramco is the study being conducted by reservoir engineers to determine the optimum rate of production for Aramco. In order to avoid exceeding MER at Abqaiq, plans are being laid for the development of Ain Dar and Qatif fields. Ain Dar promises to be the main backup and support of Abqaiq field. Wells completed at these two fields are as follows: Ain Dar 9 wells, Qatif 10 wells. Both of these fields will be produced in essentially the same manner as Abqaiq.

Drilling work in Haradh field is



Above: Abqaiq field's 65 wells, of which 45 are producing 450,000 bbl. daily. Wells are drilled to depths between 6,000 and 7,000 ft., spaced on structure contour lines at 6,000-ft. intervals.



Right: Producing fields and pipe lines of Arabian American Oil Co. The Trans-Arabian Pipe Line extending from the Abqaiq field via the Qatif field to Sidon, Lebanon, on the Mediterranean, is now being filled with oil.

being resumed after having been temporarily suspended. Four wells have been drilled in this field but no production facilities have been installed.

At Abu Hadriya, the initial discovery was drilled to 10,220 ft. in 1938. A second well then was drilled but was suspended in the early part of the war without reaching the producing zone.

It is estimated an output of 500,000 bbl. daily will be maintained for Aramco from Saudi Arabian fields with only half a dozen rigs for the next 10 years, which is as far ahead as it is reasonable to estimate. The company has never operated more than seven rigs.

The present development program calls for operating rigs in the following fields: Abqaiq, Ain Dar, Haradh, Qatif, and Damman. At present two rigs are engaged in workover jobs.

Since Abqaiq field is now well defined it is possible to predict that the present 6,000-ft. spacing pattern will be drilled up in a year. No preliminary planning has yet been done for later intermediate wells. Well depths are 6,000 to 7,000 ft., requiring an average of 60 days to drill. Some have been drilled in 35 days; some have taken 240 days. Aramco has developed new methods by which the rig is transported on a huge dolly, equipped with very large tires. This equipment makes it possible to move in 4 or 5 days. Since the 6,000-ft. intervals between wells are measured along contours of the structure for "ring spacing," they are not in accordance with spacing practices in the United States where spacing is defined in terms of area drained per well. Consequently, distances between wells would be closer in numerous cases when measured across structure. At Ain Dar, wells have been drilled 18,000 ft. apart in efforts to find the limits of the structure.

Aramco has advantages which accrue from operating on the Arabian side of the Persian Gulf. The gently tipped and folded layers of rock, with remarkably uniform lithology and thickness over wide areas, are marked contrast with the formations on the Persian side of the Persian Gulf: the latter are characterized by great overthrusts and huge, steep, complicated folds of the Zagros arch. The Arabian formations in fact are more like those of the Mid-Continent of the United States than those of Persia.

Abqaiq field's performance characteristics have been essentially those of a dissolved gas-drive reservoir. The reservoir fluid was initially undersaturated. The primary expulsive force to date has been the expansion of the undersaturated reservoir fluid. A

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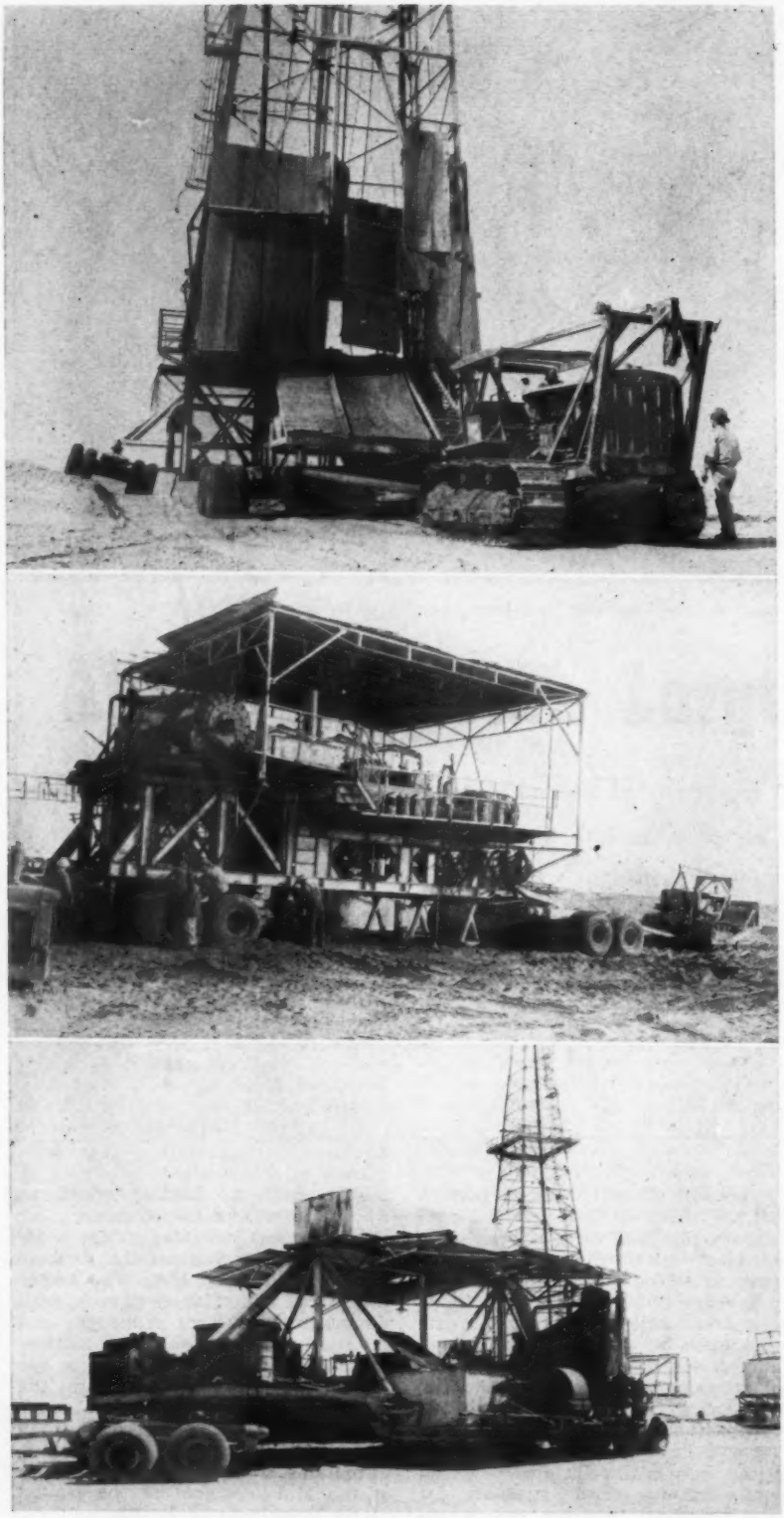

Moving rigs from location to location in Saudi Arabia is a commonplace operation because of the flat terrain. However, due to the sandy condition of the surface, the rigs are not "skidded" but are rolled along on huge assemblies of heavy-duty rubber-tired wheeled units. Arabian American Oil Co. many times has transported rigs with 135-ft. derricks 5 to 6 miles over the desert terrain. Top photo shows derrick and substructure equipment on the move; center view illustrates "wheeling up" of draw-works unit; bottom shows pump unit "ready to go."

limited water influx is occurring.

Pressure drop at Abqaiq in 1950 is 0.9 psi. per 1,000,000 bbl. of oil produced. For the history of the field it has been 1.7 psi. for 1,000,000 bbl.

Gas-oil ratios at Abqaiq and Qatif are 900 cu. ft. per barrel; at Ain Dar, 650 cu. ft. per barrel. The desirability of operating Ain Dar field as automatically as possible has induced Aramco to conduct investigations into appropriate means for achieving this objective. The only employes living in the Ain Dar area would be Arab gagers and trap operators. All other operations for the Ain Dar field would be carried on from the Abqaiq base 30 miles away.

The main Aramco pipe-line system originates at Abqaiq and extends through Qatif. Next winter the company expects to build a 30-mile, 20 or 22-in. line from Ain Dar to Abqaiq.

Wells at Abqaiq are completed barefoot, at 6,000-7,000-ft. depths, using 7-in. casing and 2⅞-in. tubing. If circulation troubles are encountered, 2,400 to 2,800 ft. of 13-in. and 4,500 to 4,600 ft. of 9⅝-in. intermediate casing may be set. The 7-in. casing is set in anhydrite within 10 to 15 ft. of the pay.

Built in Six Pieces

The drilling rigs are built so that they may be moved in six pieces, including the 136-ft. derrick. At the well location, the derrick and other heavy equipment rest on mats. These consist of two layers of 3 by 12-in. Douglas fir, which lasts 1½ years in the sandy desert characteristic of the producing areas of Saudi Arabia.

Mud materials come from the United States, Canada, and Italy. Drilling on each tour is done by an American driller, an American assistant driller, and a crew of 10 Arabs, 6 of whom work on the floor and 4 at the pumps. The tool pusher or foreman has a 24-hour responsibility for the rig. Recently Aramco has commenced teaching Arabs to act as assistant drillers. Aramco rigs are in radio communication with field offices.

Gas-separator installations, called "trap settings," handle all the crude. The high trap pressure is 500 psi., intermediate 250 psi., and low 50 psi. Sometimes a fourth 5-psi. stage trap also is used.

All crude oil destined for export is processed in stabilizing equipment to remove hydrogen sulfide gas. A stabilizer consists of conventional bubble towers, takeoffs, and reboilers. In the desulfurizing process, the vapor pressure of the unstabilized crude is reduced from 7-8 psi. R.v.p. to 2 to 3 psi. R.v.p.

The Dhahran rectification plant takes heavier gasoline fractions overhead and removes H_2S from gas, recovers pentane, and returns it to the oil with some butane. Crude oil destined for the company's Ras Tanura refinery is not run to the stabilizer.

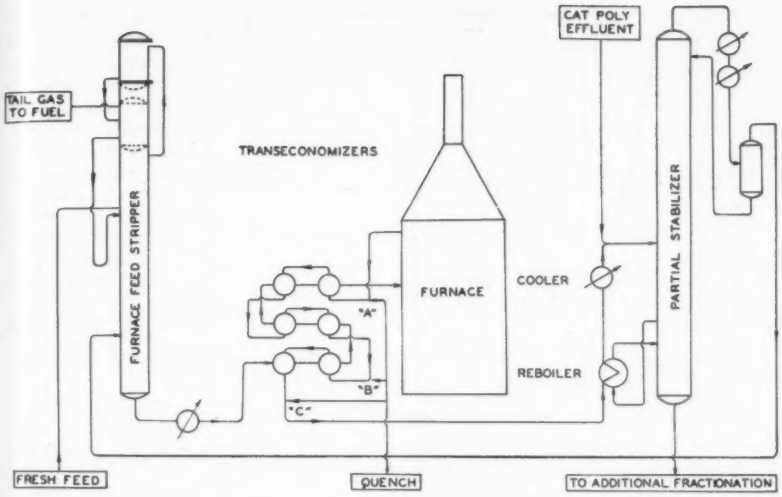

Fig. 1

Performance of Thermal Poly TRANSECONOMIZERS

by J. H. Smith*

A THERMAL polymerization unit was installed at the Wichita Falls, Tex., refinery of Continental Oil Co. by M. W. Kellogg Co. back in 1940. This unit was designed to produce 440 bbl. a day of 10-lb. R.v.p. polymer gasoline from 1,423 bbl. a day of fresh feed with a coil feed rate of 8,340 bbl. a day, giving a combined feed ratio of 5.9. The design fresh feed composition was as follows:

Component—	Barrels per day	L.V. (per cent)
Methane	4	0.3
Ethane	69	4.8
Propylene	62	4.4
Propane	716	50.3
Butylene	108	7.6
Butanes	464	32.6
Total	1,423	100.0

*Chief process engineer, Continental Oil Co., Ponca City, Okla. Presented at First Process Heating Seminar, Tulsa.

The feed consisted of light ends recovered from stabilization of pressure gasoline and raw casing head. During the war the butylene, part of the propylene, and a corresponding volume of isobutane were used to produce aviation alkylate, thereby reducing the charge to the thermal poly unit.

In 1946 a catalytic polymerization unit was installed for processing the propane - butane fraction recovered from thermal cracking and reforming. The effluent from the cat poly reactor is charged into the thermal poly unit for fractionation. In this way, the two polymer gasolines are yielded as a mixture, and the unconverted material from the cat poly operation is recovered and processed in the thermal poly unit.

The volume of butane delivered to the refinery with the unstabilized casing-head stream was substantially increased in 1946. To offset this increase in butane feed to the thermal poly unit, the propane content of the field stream was reduced. Later, facilities were installed for producing L.P.G. propane from the unstabilized casing head, leaving the thermal poly fresh feed predominantly butane with only a relatively small amount of propane entering with the cat poly effluent.

As indicated in the simplified flow diagram, Fig. 1, the furnace feed pump takes suction from the furnace feed stripper through a suction cooler and discharges through transeconomizers into the furnace coil. The charge is heated to about 1,000° F. at 1,500 psig., then held at this temperature for some time in convection section soaking tubes during which the cracking and polymerization reactions occur. After passing through the transeconomizers to preheat the charge, the furnace effluent flows through a pressure-reducing valve, thence through the partial stabilizer reboiler and a trim cooler into the partial stabilizer. The partial stabilizer bottoms are stabilized to the desired vapor pressure and rerun in equipment not shown by the flow diagram, and the light ends from the final stabilization operation are returned with the fresh feed.

Overhead from the partial stabilizer passes to the furnace feed stripper where the recycle condensate is separated from the tail gas. In addition to the variations in fresh-feed volume and composition described above, variations occur from seasonal changes in gasoline-blending requirements and raw casing-head deliveries from the field. The rate of polymerization is varied according to the volume of fresh charge available by adjusting the furnace transfer temperature.

The transeconomizers consist of six 40-ft. shells in series. Each shell is 4.4 in. i.d. and contains four 1½-in. o.d., 8-B.W. gage tubes. The furnace feed passes through the shells at an equivalent cold velocity of about 9.5 ft. per second. The furnace effluent passes through the tubes at an equivalent cold velocity of 18.2 ft. per second. The actual hot velocity of the

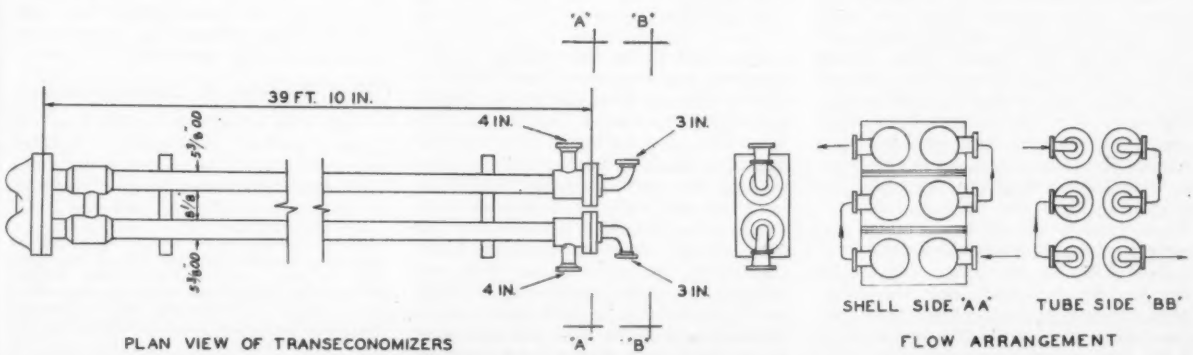

Fig. 2—Sketch of thermal poly unit transeconomizers.

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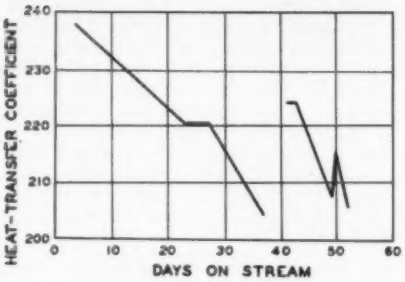


Fig. 3—(Above) Effect of coking on heat transfer in thermal poly transeconomizers with butane charge. (Run 12-9-48).

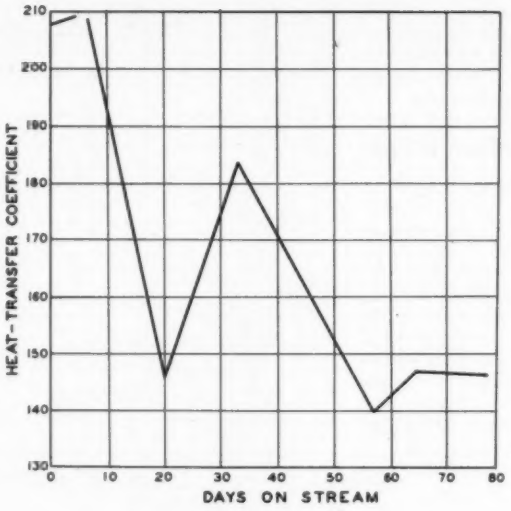


Fig. 4—(Right) Effect of coking on heat transfer in thermal poly transeconomizers with naphtha plus butane charge. (Run 7-1 and 9-18-49).

furnace effluent entering the tubes is approximately 130 ft. per second.

Performance factors specified for the transeconomizers were:

	Shell side furnace charge	Tube side furnace effluent
Rate, lb. per hr.	64,500	64,500
Mol. wt.	47.6	46.0
Temp. in, °F.	166	1,030
Temp. out, °F.	650	570
Duty, B.t.u. per hr.	23,500,000	
M.T.D., °F.	391	
Heat-transfer coef.	160	

Actual performance of the transeconomizers varies with changes in volume and composition of the fresh feed. Any change that results in a greater concentration of heavy polymers in the furnace effluent increases the rate of coke deposition in the tubes, resulting in an increase in pressure drop and a reduction in the heat-transfer coefficient. An increase in fresh-feed rate requires a higher conversion per pass thus increasing the rate of fouling.

Similarly, an increase in the concentration of butane or olefins in the fresh feed results in more severe fouling because these materials polymerize more readily and with much higher yields than does propane.

Performance of the transeconomizers attracted no attention until the last year. They worked well, consistently giving better than design heat transfer. As a result, no records were kept from which to analyze performance for the various feed rates and compositions. However, the generalizations expressed above are clearly recalled. During the time that the alkylation unit was operating and the fresh feed to the thermal poly unit was predominately propane and contained little or no olefins, practically no fouling occurred, and the heat-transfer coefficient must have remained well above 200, even after long periods of operation. The rate of fouling increased noticeably whenever the alkylation unit was shut down.

About 400 to 700 bbl. per day of virgin naphtha has been mixed with the charge to the thermal poly unit since February 1949. This operation was begun cautiously, for rapid fouling of the transeconomizers was feared. Fouling has been worse than before but not as bad as had been expected. In an effort to counteract the fouling in anticipation of higher naphtha charge rates, we have tried quench injection at two points, "A" at the first pass inlet to the transeconomizers, and "B" at the inlet to the fifth pass.

For quench we have used polymer rerun tower bottoms cooled and recycled at a rate of about 300 bbl. per day. This material consists of heavy polymer gasoline, fuel oil, and some cycle gas oil from the thermal cracking unit that is injected into the fractionation system to retard reboiler fouling. The net make of rerun tower bottoms is charged to the thermal cracking unit evaporator for separation and recovery of the heavy gasoline fractions. It has the following properties:

Gravity, °A.P.I.	31
A.S.T.M. distillation:	
10 per cent at °F.	350
50 per cent at °F.	450
70 per cent at °F.	525
90 per cent at °F.	625

We first tried quenching at the transeconomizer inlet. Pressure drop through the system increased considerably in less than a day; so quenching was discontinued for the remainder of the run. After discontinuing the quench fouling continued at a normal rate as indicated by a gradual increase in pressure drop and a reduction in heat-transfer rate. Upon inspection, it was found that the quench caused a knot of coke to build up on the inlet pipe wall a few inches downstream from the quench inlet point. No coking within the exchanger tubes was attributable to the quench.

Past experience had shown that coke deposition was usually limited to the last two passes; so quench was injected into the inlet of the fifth pass for the next run. Results of quench injection at this point have been inconclusive. The quench appears to increase coke deposition from the point of injection to about 5 ft. into the tubes of the fifth pass. From this point on through the system, coke deposition is less.

The maintenance of high heat-transfer rates seem to be improved by the use of quench, but the pressure drop increases at a higher rate when using quench. The use of quench definitely retards fouling of the partial stabilizer reboiler and the trim cooler; so quench point "C" was added at the outlet of the transeconomizers for use during test runs when quench was not added at point "B."

The coke is deposited uniformly as a thin scale in the tubes. It was observed on several occasions that the best transfer improved after shutdowns, even when the transeconomizers were not opened and cleaned. This was attributed to the sloughing off of coke when the tubes cooled. The operators have taken advantage of this principle by reducing the furnace transfer temperature or changing the point of quench injection for short periods. The first attempt generally results in considerable improvement with each subsequent attempt resulting in less gain.

Conditions at the start and end of two runs are shown in Table 1, one run with and one without naphtha. Typical compositions of furnace charge are shown in Table 2. A simplified sketch of the transeconomizers is shown in Fig. 2, and heat-transfer coefficients versus time are plotted in Figs. 3 and 4. Note from the irregularity of these plots that the self-cleaning appears to happen frequently during operation.

Heat Transfer in Transeconomizer

Fig. 3 is a day-by-day plot of the heat-transfer coefficient obtained when the unit was operating on a feed consisting essentially of butane. A summary of the run follows:

Twenty-third day.—The heat-transfer coefficient fell off from a value near 240 at the start to about 200 by the twenty-third day. At this point the coefficient leveled off for 4 or 5 days and then began to drop more rapidly than before. Due to lack of operating data, the cause for this leveling off is unexplained.

Thirty-eighth day.—The unit was shut down for emergency repairs. The heat-

TABLE 1—OPERATING CONDITIONS

Feed: Propane-Butane (Run 12-9-48 to 1-28-49)

	Temperatures, °F.				Pressure, psig.		Flows, bbl. per day		
	Furnace feed		Furn. effluent						
	To econ.	From econ.	Furn. trans.	Econ. out	Furn. out	Econ. out	Furn. charge	Quench	Naphtha to feed
Beginning of run	110	655	993	411	1,525	1,040	8,800	None	None
End of run*	110	650	1,002	415	1,500	960	7,800	None	None
Feed: Propane-Butane Plus Naphtha (Run 7-1-49 to 9-18-49)									
Beginning of run	115	629	991	420	1,550	1,080	9,000	450	500
End or run	115	597	979	436	1,600	640	7,000	500	500

*Data given are for 1-28-49 just before naphtha was added to feed. Actual run continued until 3-6-49.

TABLE 2—COMPOSITION OF FURNACE CHARGE

Date	L.V. (per cent) Propane-butane feed 3-29-49	L.V. (per cent) Propane-butane plus naphtha feed 11-2-49
C_1	2.4	1.5
C_2—	1.0	0.9
C_2	10.0	10.9
C_3—	5.9	4.9
C_3	23.0	27.4
C_4—	3.6	3.8
i-C_4	22.8	11.6
n-C_4	31.3	29.4
C_5+	0.0	9.6

transfer coefficient had fallen off to about 203.

Forty-first day.—The unit was started up. No mechanical cleaning of the exchangers was performed during the shutdown; however, note that the heat-transfer coefficient rose to about 225 immediately after startup. This reflects the self-cleaning of the exchangers during the cooling-off and starting-up periods.

Changing flows and temperatures probably caused coke particles to dislodge from the tube wall. After operations were lined out, the coefficient declined at a much higher rate than before. Irregular coke particles adhering to the tube wall after startup apparently accelerated coking of the exchangers.

Forty-ninth day.—Reforming naphtha was injected into the fresh feed at the rate of 475 bbl. per day. Prior to charging the naphtha, the heat-transfer coefficient had fallen to about 207. The inclusion of the comparatively heavy naphtha in the feed resulted in some cleaning of the economizers and the coefficient rose to about 215 after about 2 days and then began to fall rapidly.

The unit was shut down after a run of 87 days on account of a high-pressure drop across the partial stabilizer reboiler and loss in heat transfer in the transeconomizers.

Fig. 4 is a plot similar to that of Fig. 3 except that it covers a run when reforming naphtha was included in the feed.

The unit was started up again on July 1, 1949. Note that during this run approximately 500 bbl. per day of quench was injected into the inlet of the fifth economizer pass. A summary of conditions affecting the heat-transfer coefficient is as follows:

Fifth day.—Shut down for 31 hours on account of a loose header plug on the furnace.

Seventeenth day.—Washed economizers by injecting light cycle stock into the inlet to the economizers. Due to high pressure at the inlet very little quench stock was injected and the washing was ineffective.

Nineteenth day.—Lowered transfer temperature 5° to 982° F. Transfer temperatures were maintained in the temperature range 979°-983° F. throughout the remainder of the run.

Twenty-first day.—Charge rate was lowered because of the increasing pressure drop through the transeconomizers. At the same time, heat transfer in the transeconomizers began to improve rapidly; and on the twenty-eighth day the charge rate was increased 500 bbl. per day to the former charge rate of 8,700 bbl. per day. The improvement in heat transfer continued until the thirty-second day.

Thirty-second day.—The combination unit was shut down for cleanout, and the naphtha charge and quench were discontinued. Quench was started again on the thirty-fourth day, and naphtha charge on the thirty-fifth. The heat-transfer rate, however, dropped steadily until approximately the fifty-seventh day.

Fifty-third day.—Because of the increasing pressure drop across the economizers, the charge rate was lowered 500 bbl. per day to 8,200 bbl. per day.

Fifty-fifth day.—Because of the poor heat transfer being obtained, an attempt was made to clean the transeconomizers by cutting out the quench for a few hours. Very little benefit was obtained. The heat transfer increased slightly for a few days, then leveled off until the end of the run.

Seventy-ninth day.—The thermal poly unit was shut down because of a high pressure drop across the transeconomizers. Upon inspection, a ¼ to ⅜-in. deposit of coke was found at the inlet to the fifth economizer pass. The coke was localized in two ells immediately downstream from the point where the quench was introduced and extended 4 or 5 ft. into the tubes of the fifth economizer pass.

Conclusions

As a general rule, coking in process heating and cooling equipment is most severe at that point in the system at which the transition from vapor to liquid just commences or where the reverse transition nears completion, provided that the temperature at such point is sufficiently high to cause thermal decomposition of the liquid portion of the process stream. High-boiling condensation products of thermal cracking and polymerization are especially unstable so that coking may occur at relatively low temperatures as in the case just described in which coking occurs in the temperature range of 600° to 400° F. Of course, for appreciable coking to occur at such low temperatures, it is necessary that the liquid undergoing coking reactions be maintained at this temperature for a prolonged period, which is the condition that prevails when the concentration of liquid in the flowing stream is too low to result in effective washing of the tubes.

In a heating or cooling cycle during which a transition point occurs that might cause severe coking, the transition is sometimes made instantaneous to minimize or avoid coking. For example, in heating and vaporizing a heavy gas oil, steam may be injected into the stream at that point where vaporization approaches completion to cause flash vaporization of the residual liquid. Similarly, in a cooling cycle, quench may be injected at some point above which condensation commences and in sufficient quantity to immediately give an appreciable concentration of liquid phase in the stream. Actually, we expected rapid coking at the quench point as did occur because of localized subcooling when a small amount of quench was injected at the inlet to the transeconomizers. However, the test was easy and cheap to make and could do no harm if stopped in time; so we tried it on the off chance that it might improve operation.

The usual design for thermal polymerization units charging light hydrocarbons such as propane and butane specifies the use of tubular transeconomizers for heat exchange between furnace feed and effluent streams. In designing naphtha reversion or polyform units for inclusion of high concentrations of naphtha or gas oil in the furnace charge, a tar knockout drum and circulating quench system is usually specified.

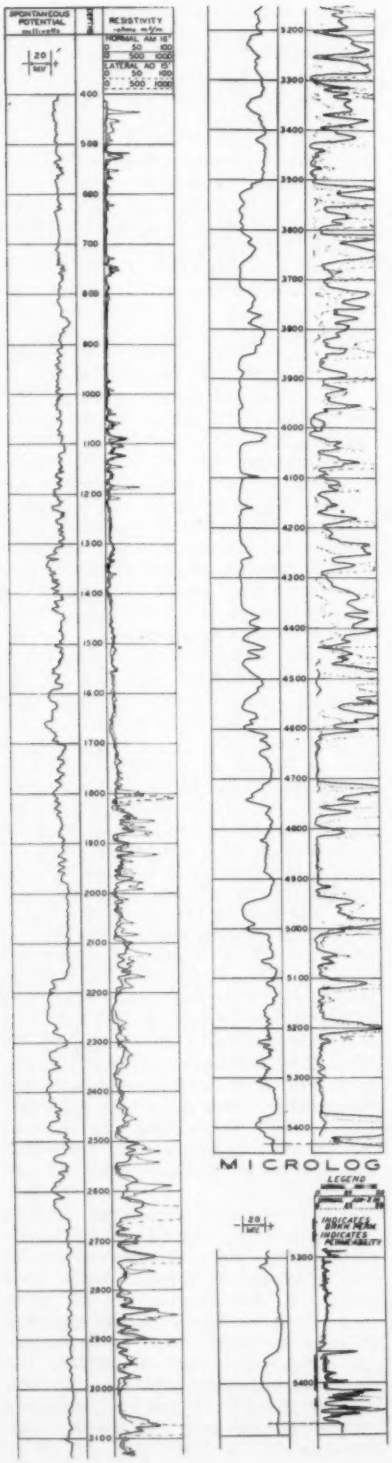
In the foregoing case, the tar is cooled by exchange with the furnace feed or other process streams and recycled to the furnace effluent line at sufficient rate to cause instantaneous formation of a high liquid concentration in the effluent stream. Obviously, the transeconomizer system is the simpler in design and lower in construction and operating costs, so that it is preferred when severe coking conditions are not expected.

In addition to the above the transeconomizer makes possible waste-heat recovery at a higher temperature level. Note that we heat the furnace feed to 650° F. in the transeconomizers at Wichita Falls, and, if desirable, this temperature could be increased by increasing the heat-exchange surface. In the tar quench-type operation, the temperature after quench is generally below 650° F. so that waste heat cannot be economically recovered above 600° F. and generally considerably lower.

It is not known why small changes in coil feed rate caused apparent self-cleaning of the transeconomizers as was indicated at Wichita Falls. It is suggested that flexing of the tubes may have resulted from localized changes in temperature or pressure. As indicated in the examples, the improvements from self-cleaning were usually short lived and of decreasing magnitude at each subsequent occurrence.

XUM

Fort Chadbourne Field Scene of Active Drilling Program in West Texas



Electric and microlog of Humble Oil & Refining Co.'s B-4 Sallie Odom, 330 ft. from south line, 2,085 ft. from most southerly southeasterly line of J. B. Childers Survey No. 36 (6 miles northwest of Wingate). Derrick-floor elevation, 2,052 ft., mud resistivity 0.45 ohms at 148° F. bottom-hole temperature. Electrode spacing, AM = 16 in., AO = 15 ft.

Runnels is another one of those West Texas counties very active in drilling developments. Here the Journal presents the latest in its regular series of articles on "Active Fields."

by Roy F. Carlson
Dallas District Editor

ONE of the high points of field-development activity in West Texas is located in Fort Chadbourne field, northwest Runnels County, and in adjoining Coke County.

Development in Fort Chadbourne field is in the Odom lime, a local formation in the Strawn of Pennsylvanian age, and has been characterized by stepouts of a mile or larger. The area in which activity is taking place is presently indicated to be nearly 7 miles long and about 3 miles wide. A Texas Railroad Commission order on field rules says the field proper consists of 2,000 acres, however.

The field produces from a depth of about 5,300 ft. The reservoir has an average gross thickness of about 44 ft., half of which is considered effective. Testimony at the Texas field-rules hearing indicated that the average porosity is about 12 per cent and that the section has an average permeability for the effective section of 100 md. The porosity is vugular and intergranular in nature.

Original reservoir pressure was 2,330 psi. at a datum of 3,400 ft. subsea. The reservoir oil was saturated at original pressure and had a solution gas-oil ratio of 1,034 cu. ft. per bbl. Viscosity of the oil at original pressure and formation temperature of 134° F. is 0.31 cp. Produced crude is sweet and has a gravity of 45° A.P.I. or better. The producing mechanism is believed to be dissolved gas expansion.

Interference tests conducted on wells near the center of the field indicate that there is communication between wells, and that each well is capable of draining at least 40 acres. Per acre oil recovery has been estimated at between 2,500 and 3,000 bbl.

Potential tests on four wells in the field gave the following results: (1) Based on the last 5 hours of a 26-hour flowing test through ¼-in. choke, the well produced at a rate of 336 bbl. daily, with no water and a gas-oil ratio of 1,114 cu. ft. per bbl. (2) On a 6-hour test with a 12/64-in. choke this well produced at a rate of 227 bbl. of oil per day, no water, and with a gas-oil ratio of 1,070 cu. ft. per bbl. (3) On the basis of a 23½-hour test through a 12/64-in. choke this well flowed at a rate of 216 bbl. per day with a gas-oil ratio of 1,200 cu. ft. per bbl. (4) On a 5.58-hour test with a 10/64-in. choke this well flowed at a rate of 132 bbl. of oil per day with a gas-oil ratio of 823.

Spacing rules.—Field regulations set forth by the Railroad Commission require that a minimum spacing of 933 ft. between wells on the same lease be maintained and that no well may be drilled closer than 330 ft. from a property or lease line. Where necessary, the commission will grant exceptions to these spacing rules.

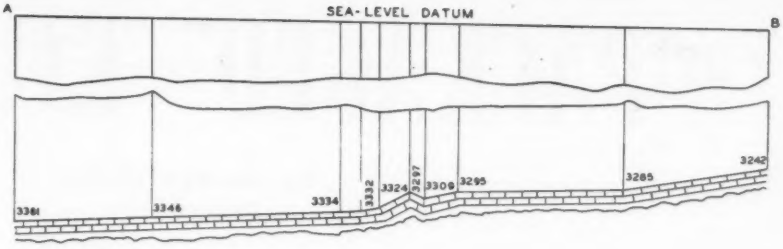
For the purposes of allocating oil production, proration units are considered to be 40 acres or less unless the broken-up tracts shown on the map leave less than 40 acres when a tract is drilled up. In such a case, the remaining acreage will be assigned to other proration units in amounts of not more than 20 acres.

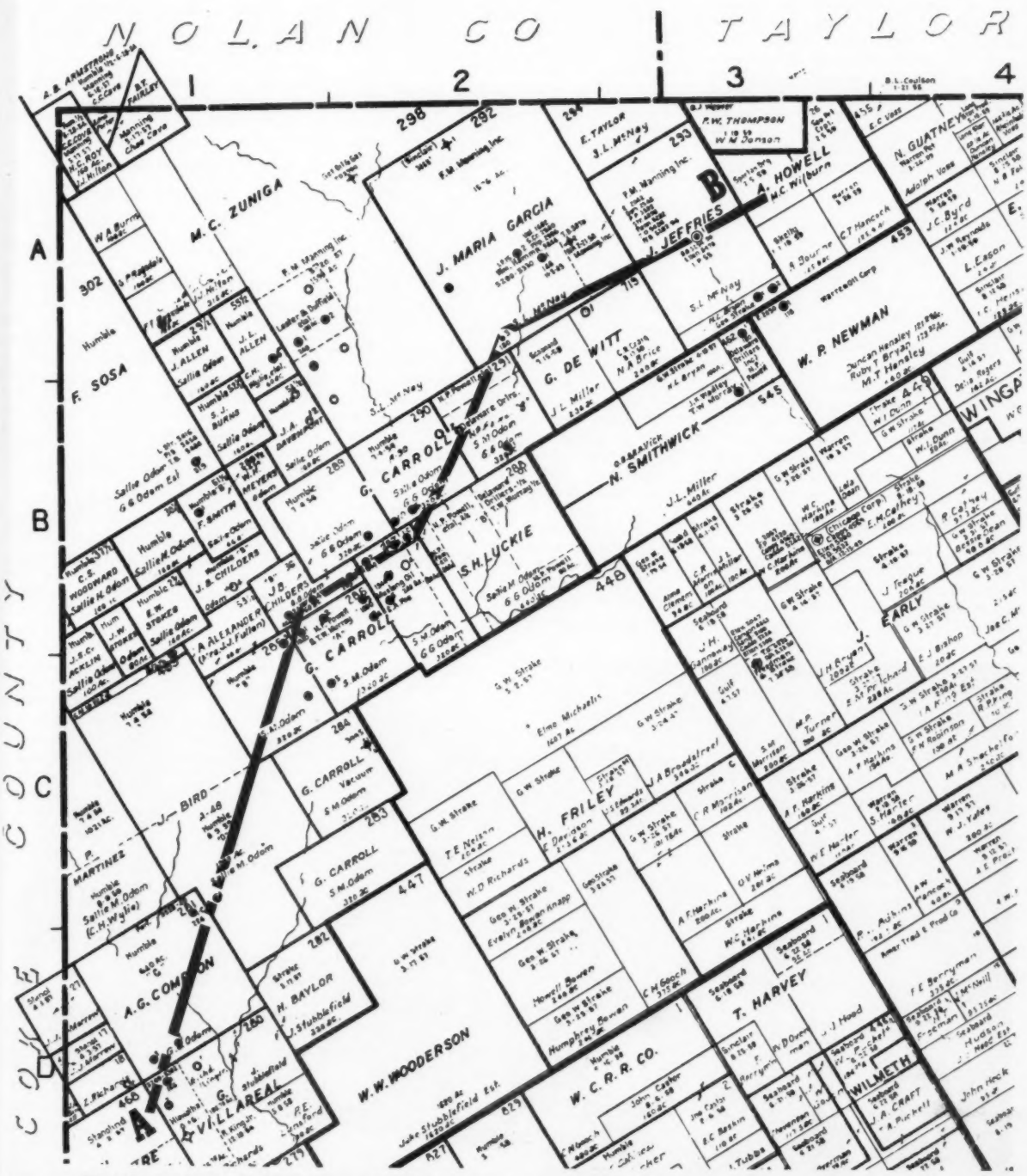
Allowables are further determined 75 per cent on acreage and 25 per cent on the well for all wells and production not assigned to marginal or high-gas-oil-ratio wells. The limiting gas-oil ratio is 2,000 cu. ft. per bbl. Allowables have been set at 102 bbl. per day.

Field rules provide for two strings of casing; a surface string of not less than 250 ft. must be set and cemented to the surface, and an oil string must be set below the gas-oil contact and cement must fill the annulus at least above the Canyon reef lime, overlying the Odom and found at depths ranging from 3,200 to 4,000 ft. Fresh subsurface waters are found at a depth of about 200 ft.

Testimony at the field-rules hearing indicated that the field may en-

compass up to 10,000 acres eventually. This testimony also indicated that the pay is a monoclinal blanket structure that dips in a westerly direction. A northeast-southwest section is shown in an accompanying diagram. The trap is evidently formed by a porosity pinchout and a thinning section. The oil-water contact has been indicated to be at a minus 3,484 ft. High-gas-oil-ratio wells in the eastern portion of the field indicate a gas cap.





Map of area (base courtesy Southwest Mapping Co., Fort Worth), and cross-section through wells along profile A-B.

XUM

"PACKAGED" T.C.C. UNIT

by George Weber
Refining Editor

THE small "packaged" T.C.C. unit recently announced by Socony-Vacuum Oil Co., Inc., is designed expressly for the refiner whose catalytic cracking needs may be met with a smaller-than-average plant. By means of standardization, simplified design, and prefabrication, cost per barrel of charge for the new units may be reduced to a point comparable with that of much larger plants.

The packaged units will be available in two design sizes, with nominal reactor feed capacities of 3,000 and 6,000 bbl. per day. They conform in general to the larger 15,000-bbl. per day modified T.C.C. units, of which nine are now under construction in this country. Air lift now replaces the mechanical bucket lift of former T.C.C. units, increasing catalyst circulation, improving unit flexibility, and reducing operation and maintenance costs, according to designers. Design of the new kiln or regenerator has been greatly simplified. One burning zone replaces the multiple zones of earlier models.

Socony-Vacuum Design

Detailed design of the two units has been completed by the licensing company and is being made available to engineering and contracting firms for plant construction. One such organization, Southwestern Engineering Co. of Los Angeles, has gone one step further with a plan for complete shop fabrication of all component parts for rapid low-cost field assembly.

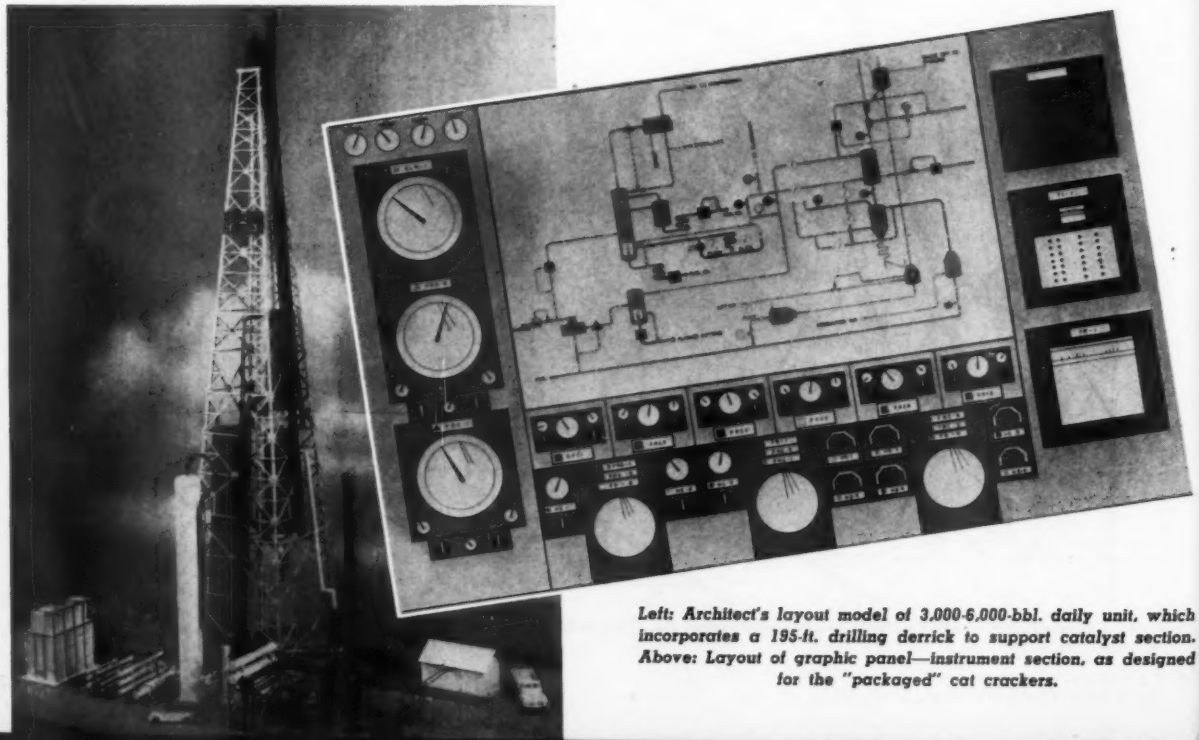
A key to the low cost of the new units is the availability of a completely engineered unit which will meet the small refiner's needs without costly revision or redesign. While standardized, this design affords considerable flexibility of operation. The feed-preparation unit will charge various types of crudes and fractions including whole crude, reduced crude, topped crude, wide cut gas oil, narrow-cut gas oil, or gas-oil mixes. Desired yields and product specifications for various feed-stock samples provided by prospective operators, are being evaluated at Socony-Vacuum Laboratories. On the basis of pilot-plant runs, the licensor will extend a performance guarantee for the packaged unit.

The schematic flow chart (Fig. 1) represents the 3,000-bbl. unit, based on Socony-Vacuum design. It comprises three sections: feed preparation and fractionation, catalytic cracking, and stabilization. Incorporating charge preheat, the feed-preparation section provides for either vapor feed alone, or combined vapor and liquid feeds to the reactor. When liquid feed is desired, a condensed fraction of vacuum distillate is sprayed within the falling catalyst curtain at the top of the reactor. When vapor feed only is employed, tar separator bottoms are removed to storage. A principle of the modified T.C.C. process is maximum use of charge preheat, thus minimizing additional heat required from regenerated catalyst.

Catalytic Section

In the catalytic section, greater catalyst-to-oil ratios are possible with the new air lift. With T.C.C. units of previous design, catalyst-oil ratios were generally restricted to 1 : 1 or 2 : 1. For the modified process, designers recommend operating at nominal catalyst-oil ratios on the order of 3 : 1 to 5 : 1. While higher ratios are possible, Socony engineers point out that they result in heavier coke formation on the catalyst and increased purge requirements, whereas better stripping, lower cake, and higher liquid recovery result from controlling catalyst-oil ratios to the level recommended.

A common blower discharging at 3 psig. may be installed in the 3,000-bbl. unit to furnish both lift air and combustion air. A single wheel blower requiring a minimum of 275 hp. will provide sufficient air for the smaller unit.



Left: Architect's layout model of 3,000-6,000-bbl. daily unit, which incorporates a 195-ft. drilling derrick to support catalyst section. Above: Layout of graphic panel—instrument section, as designed for the "packaged" cat crackers.

The air lift is designed for circulation of 90 tons per hour of catalyst in 3,000-bbl. unit and double that rate for the 6,000-bbl. size. The smaller unit will employ a 15-in.-diameter lift pipe to elevate catalyst to the separator whose top is 204 ft. above grade.

Separation of catalyst fines will be carried out in a much simplified elutriator. Based on pilot-plant experience and full-scale air-lift performance, catalyst loss in the small unit will average less than 0.4 ton per day, say design engineers. A catalyst-storage vessel also installed in the derrick structure will comprise three sections for fresh catalyst daily makeup, hot catalyst for use during turnarounds, and catalyst fines.

No vessels will exceed 12 ft. in diameter, so that they may be prefabricated and shipped within the clearance limits prescribed by railroads. The kiln is designed with the maximum allowance, being 12 ft. in diameter and about 38 ft. in height. In the smaller unit, the kiln is centered beneath the 10-ft.-diameter by 34-ft. 6-in. reactor. The 6,000-bbl. unit differs principally in using two kilns of the same size to handle the regeneration of double the catalyst circulation. If eventual expansion to 6,000 bbl. is anticipated, the smaller unit may first be erected and later expanded at nominal cost.

The reactor is similar to that in older T.C.C. units. It provides concurrent downward flow of feed stock and moving bed catalyst. Purge steam is used for stripping at the base of the reactor. Catalyst cooling at the base of the kiln may recover waste heat in form of steam.

The same type of moving bed catalysts employed in other T.C.C. units may be used for the new design. Kiln temperatures up to 1,250° F. for synthetic catalysts and 1,150° F. for natural catalysts may be maintained.

The fractionation section differs mainly from the conventional in the additional superheat provided reactor effluent. The main fractionator and tar separator are superimposed in the same column. Provisions are made for cycling cracked oil to increase gasoline yield, when desired.

Daily capacity of the predesigned units will vary with the conditions of operation. The smaller unit, rated at 3,000 bbl., may process as much as 5,000 bbl. of crude, or from 2,000 to 4,000 bbl. of gas-oil feed stock, depending on desired conversion.

Prefabricated Units

Southwestern Engineering Co. is the first engineering contractor to announce complete prefabrication of the two packaged units based on Socony-Vacuum design. Wherever possible, equipment will comprise standard stock items. Vessels, including all internals, heaters, lines, control panels, etc., will be completely fabricated in the company's shops and will be shipped ready for installation.

Vessels, pumps, and other equipment will be protected with stainless steel wherever necessary for corrosion-resistant operation on sour feed stocks. This precaution, plus the design flexibility of the units, will preclude the necessity for altering the design of any unit to meet specific operating conditions.

Standardization and prefabrication will accrue savings in two ways. SWECO engineers expect to be able to cut erection time to almost half the period usually required for comparable units. Completion within 6 to 8 months is anticipated after receipt of authority to proceed, subject to weather, location, and similar factors.

Standardization will spread the engineering cost over a number of units, and will further allow multiple manufacture and purchasing of equipment. While fixed costs of the two units cannot be stated since they will be affected by varying labor, transportation, and other expenses, the cost of the two small units will compare favorably on a per barrel capacity with much larger units of the same type.

The construction firm is prepared to furnish complete integrated units comprising feed preparation, cracking, stabilization sections, or single sections which will operate in conjunction with existing facilities. The complete unit will occupy a site approximately 150 by 200 ft.

Derrick Structure

Use of the standard oil-field derrick as the cracking-plant structure is a practical, economical solution, say designers. The 195-ft. derrick will mount the necessary rigging to lift cracking section vessels into place during erection. The superimposed reactor and kiln will occupy one corner of the derrick structure and the catalyst storage vessel will be erected in an opposite corner. The lift pot, lift pipe, and catalyst separator surge vessel will be centered in the structure and a stairway will be installed to the top of the reactor, about 130 ft. above grade. A ladder with a safety cage will continue upward to the catalyst separator at the top of the structure. Aside from the additional bracing and platform members required for rigidity and vessel support, the only further departure from standard derrick design will be substitution of a heavier leg for the corner supporting the reactor and kiln. The structure will withstand a wind load of 100 m.p.h.

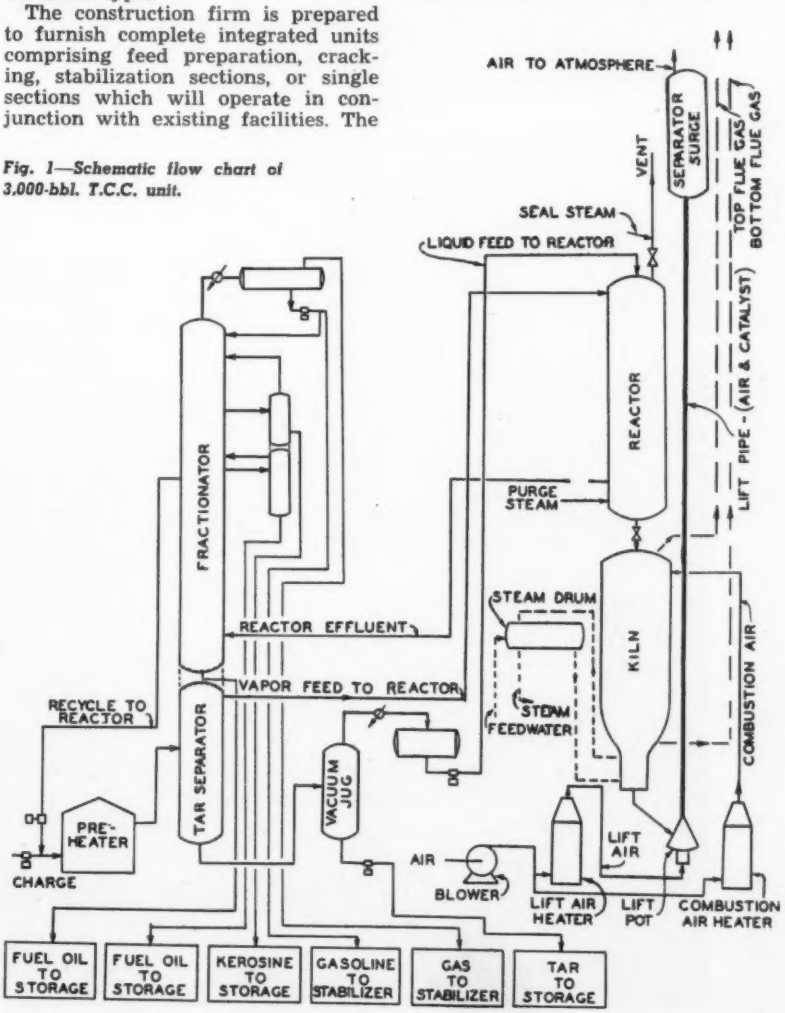


Fig. 1—Schematic flow chart of 3,000-bbl. T.C.C. unit.

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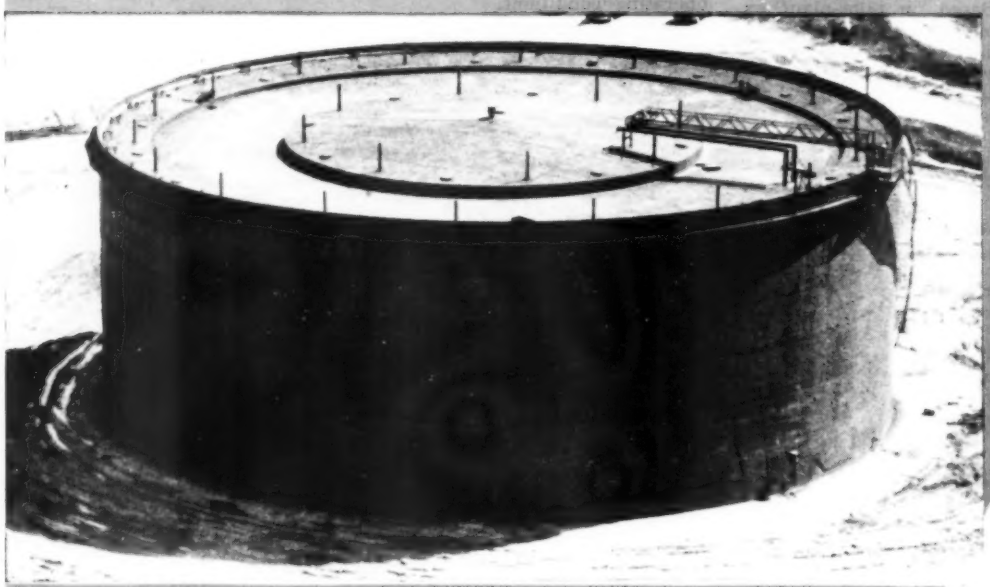
Exclusive features mean bigger savings . . .



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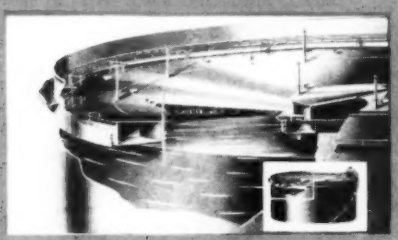

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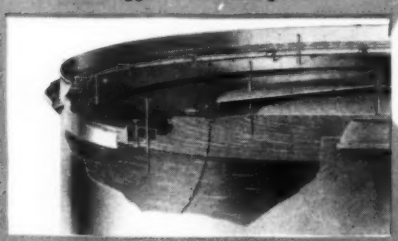

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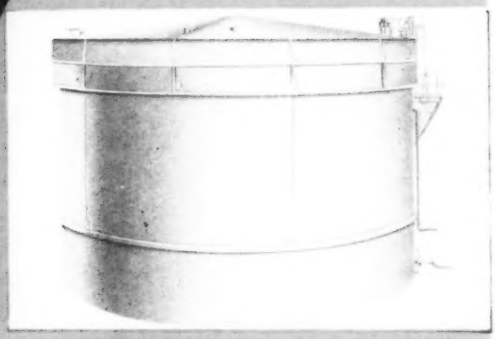
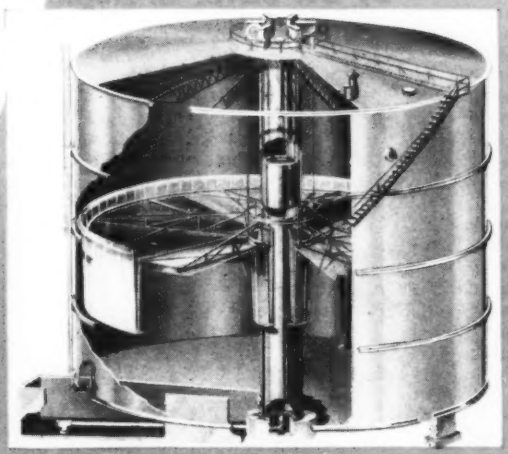


Wiggins Dry Seal Lifter Roof

Turns breathing and pumping losses into profits! The 100% dry seal, which has a life equal to that of the tank, eliminates "wet seal" corrosion problems—requires no heating system during freezing weather. No fire hazard. Has low initial cost—low upkeep. Attention, adjustment or lubrication not needed.

Wiggins
DRY SEAL GASHOLDER
Typical Average Pay-Out
20 MONTHS



Wiggins Dry Seal Gasholder interconnects at standard working pressure with all cone roof tanks for a complete vapor balancing system.

The economical way to conserve the vapors of a single tank or two interconnected cone roof tanks. The roof is supported by confined vapor, rising and falling as the volume changes. Has a patented dry seal to prevent vapor from escaping. Internal pressure exceeding 1¼" of water causes roof to lift. Maximum roof lift is 10 feet. Balancing system keeps roof level even under eccentric load conditions produced by wind or snow.

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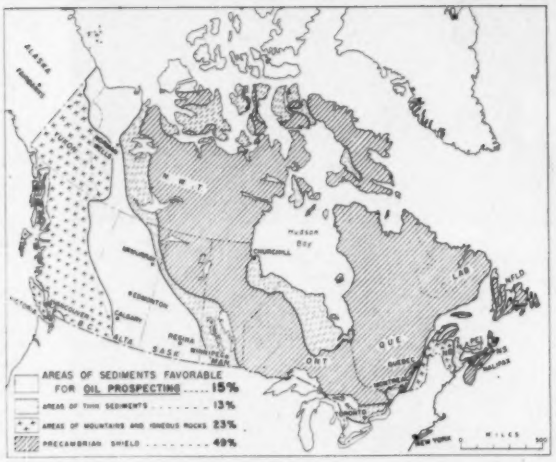

AREAS OF SEDIMENTS FAVORABLE
FOR OIL PROSPECTING 15%
AREAS OF THIN SEDIMENTS 13%
AREAS OF MOUNTAINS AND IGNEOUS ROCKS 23%
PRECAMBRIAN SHIELD 49%

Fig. 1

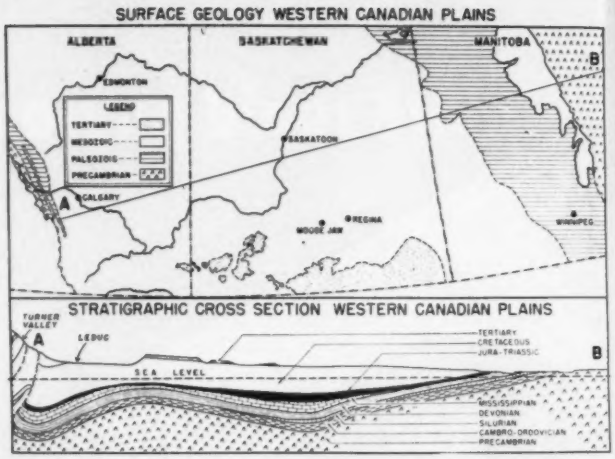


Fig. 2

OIL IN WESTERN CANADA

This article gives over-all report on geology-exploration, drilling-development, refineries and pipe lines.

by Dr. Oliver B. Hopkins*

CANADA vies with Pennsylvania as the birthplace of the oil industry. In fact, the Williams well near Oil Spring in southwestern Ontario, dug in 1858, has been acclaimed by some as the first in North America.

Eastern Canada

Since then, about 18,000 wells have been drilled in Ontario, the majority of them dating back before 1900. However, their total production has amounted to only slightly over 30 million barrels, and no large oil discoveries have been made in the last 35 years. In 1945, a small pool was discovered at Becher and is now producing about two-thirds of the total Ontario production of 800 bbl. per day. Some minor gas discoveries have also been made in this area in recent years.

Ontario accounts for all the oil and gas production in eastern Canada except for an extremely small amount produced near Moncton in New Brunswick.

Western Canada

In the west, substantial reserves have been located only in Alberta and even there the discoveries of the past 3 years followed decades of disappointments.

Active exploration for oil in western Canada dates from 1919. The following year saw a successful completion at Norman Wells, 2,000 miles north of the international boundary, and just 70 miles south of the Arctic Circle. It was not actively developed, however, until the recent war, when 65 producing wells were drilled and potential production rose to 4,000 bbl. a day. Reserves are now placed at 30 million barrels. This field serves a useful purpose locally by supplying products to the mining industry in the area and to vessels on the Mackenzie River and even on the Arctic Ocean.

In 1936 an important discovery was made at Turner Valley, about 70 miles south of Calgary. Naphtha and a little light crude had been found in the valley as early as 1914, and 10 years later deeper drilling uncovered a large wet-gas field. Then in 1936 crude was established on the west flank of the structure. Turner Valley reached the peak of its production in 1942 when the daily average rose to 28,000 bbl. Since then, it has declined to about 10,000 bbl. a day. Total crude production from the pool has been about 95 million barrels and it may yet yield a further 25 million barrels.

Despite heavy expenditures of money and effort, the search for a second Turner Valley in the Rocky Mountain foothills has proved disappointing. Only two other foothills fields have been found; one at Jumping Pound west of Calgary, and the other recently at Pincher Creek in southern Alberta. Both of these are gas- distillate fields.

A considerable amount of exploratory work was also done in the Alberta plains, but without notable success until 3 years ago. Three or four small pools of heavy oil were discovered in the southern part of the province and a larger field—at Lloydminster—on the line between Alberta and Saskatchewan. Total production from these fields had never exceeded 2,500 bbl. a day prior to 1947.

Discoveries of the past 3 years in Alberta, however, have been impressive.

Prospective Oil Territory

Canada is a large country covering an area about 25 per cent greater than the United States. Its prospective oil territory is somewhat greater than the total area of the states of Texas, Louisiana, Oklahoma, and California. Canada's interior plains cover some 650,000 sq. miles, or about 15 per cent of the entire country. (See Fig. 1.)

The upper part of Fig. 2 shows the southern portion of Canada's three prairie provinces; the lower part is a simplified geological cross-section of this area.

It is to be noted that at the right

*Vice president, Imperial Oil Co., Ltd., Toronto. Summarization of Eastern District paper, A.P.I. Division of Production, Cleveland.

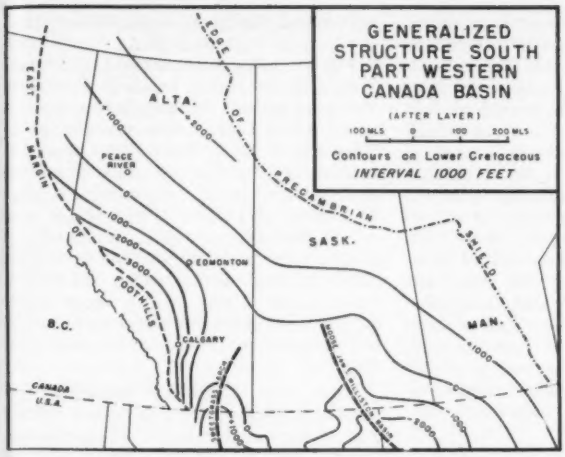


Fig. 3

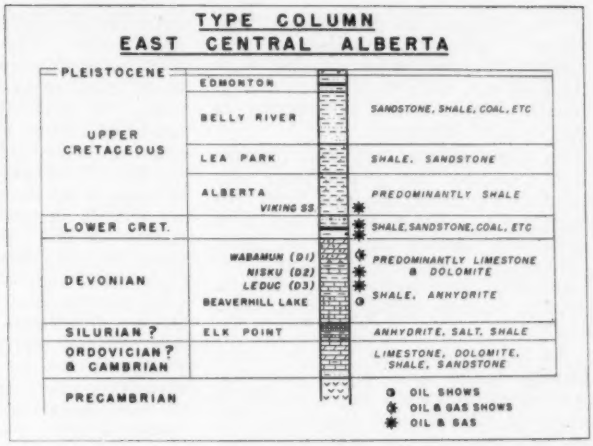


Fig. 4

the pre-Cambrian rocks of the Canadian shield are at the surface; that they dip under the younger sedimentary rocks; and that the sediments attain progressively greater thickness to the west. At the extreme left, the sediments are much disturbed by the upfaulting of the Rocky Mountains. Our particular interest is in the shales, sandstones, and limestones which underly the plains area and attain a maximum thickness of 12,000 to 15,000 ft. near its western edge. These rocks range in age from Cambrian to Tertiary and are, in large part, of marine origin.

Note, too, the thick basin of accumulation in the middle of the cross-section—called the Williston or Moose Jaw basin; and to the west the even deeper Alberta basin. These are separated in southern Alberta by the Sweet Grass arch, which has its major development in Montana.

Fig. 3 covering the same area as the previous one, shows by contours on the Lower Cretaceous the same general features—the Moose Jaw basin; the Sweet Grass arch which loses its distinctive character in southeastern Alberta; and the Alberta basin which has its greater depth, and thus contains its greatest thickness of sediments, just in front of the foothills of the Rockies.

Fig. 4 shows a generalized section of the rocks in the Edmonton area of East-Central Alberta. Note that the pre-Cambrian is overlain by Cambrian and possibly Ordovician sandstones and limestones in which no important showings of oil or gas have been found. Above come deposits of anhydrite, salt, and shale referred to tentatively as Silurian. Salt is widespread over northeastern Alberta and in west-central and southern Saskatchewan.

Next higher in the section are the Devonian limestones, dolomites, shales, and anhydrites. The middle part of this section carries the important oil and gas horizons in the newly discovered fields of Central Alberta—at Leduc, Golden Spike, and Redwater. The most important producing horizon is the D-3 or Leduc member. To the south and west of this area of Central Alberta, limestones of Mississippian age overlie the Devonian and carry the producing horizons of Turner Valley. Those limestones have been eroded from the central area and the Devonian here is immediately overlain by the Lower Cretaceous. Sands of this age carry two oil and gas-producing horizons. The oil from them is generally heavy—from 14° to 18°—but locally some lighter oil of 30° or better has been found, e.g., in the Gilbert and Whitemud pools near Leduc.

The Upper Cretaceous is barren of oil and gas except in its lower part where a widespread gas-bearing sand is found—the Viking sand. This sand, or essentially its age equivalent, has produced gas in southern and Central Alberta for many years and will be the source of much of Alberta's gas in the future. Showings of oil have been found in this horizon at many places and only recently commercial oil of 38° gravity has been found at Joseph Lake.

Exploration Activity High

Western Canada is now one of the most active oil exploration areas in the world. At the end of last year, more than 100 Canadian and United States companies were doing active exploration work in Alberta, Saskatchewan, and Manitoba. At that time, a total of 105 geophysical parties, made up of 81 seismic parties, 23 gravity-meter parties, and 1 magnetometer, were working in the area. In addition, several core drills were being used, especially in areas where

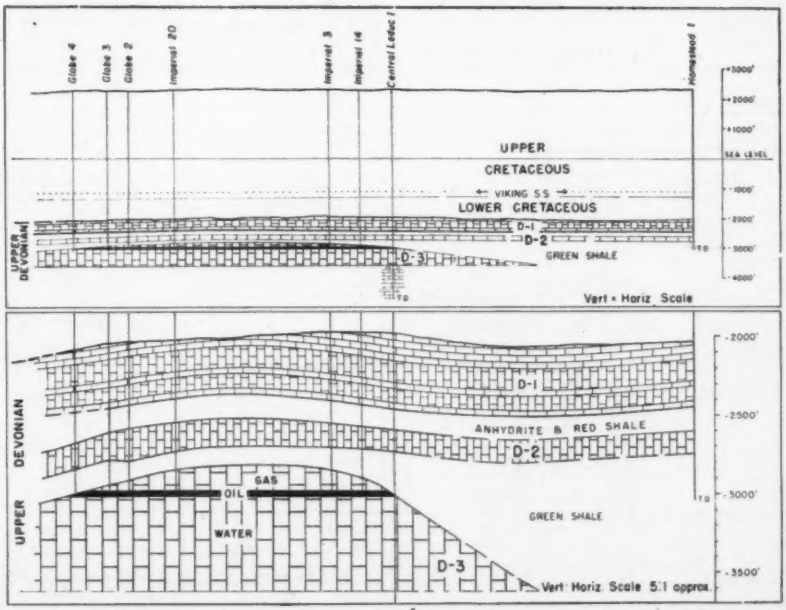


Fig. 5—Cross-section, Leduc oil field.

XUM

it was difficult to get reliable geophysical data. The number of geophysical parties about doubled during 1949 and made the Canadian West second only to Texas in intensity of geophysical effort.

In view of the fact that production from all the recent large discoveries has been obtained from reef formations of Devonian age and from structures formed on top of reefs, efforts have been largely concentrated on locating such reefs, with reflection seismic surveys being the most used method.

At the beginning of 1949, the total acreage under lease and reservation was about 55,000,000 acres, 44,000,000 acres in Alberta and the remaining in Saskatchewan and Manitoba. During the year, Saskatchewan received its first large leasing play, and total acreage held increased from 10,000,000 to 60,000,000, while Alberta also showed a substantial increase to 60,000,000 acres. Small leasing plays also started in Manitoba and British Columbia, bringing the total at the end of the year to approximately 125 million acres. This is more than six times the acreage under reservation 3 years ago, and represents an area almost as great as that of Oklahoma, Louisiana, and Kansas combined.

Last year a total of 845 wells was drilled in the prairie provinces—784 in Alberta, 58 in Saskatchewan, and 3 in Manitoba; of these, 203 were wildcat. This compares with 249 wells in 1948 and only 59 in 1946.

Altogether, the oil industry spent 100 million dollars on exploration and development in western Canada last year, and is spending at the rate of 150 million this year. Some idea of the increase in activity may be obtained from the fact that expenditures doubled each year from 1946 to 1949.

First of the recent Alberta discoveries, and the spark which has fired the intense exploration activity, was Leduc. The Leduc discovery well, near Edmonton in Central Alberta, came in as a producer on February 13, 1947. Its importance was not only that it found a field which contains some 250 million barrel of oil, but, even more, in the fact that it opened up new hunting grounds for the oil prospector. At Leduc, oil occurs in the limestone formation which is older than that which produces in Turner Valley. Its discovery gave new promise to a large and relatively unexplored area, and it also indicated an additional formation in which oil may be expected. It is not surprising that Leduc was designated the continent's most important discovery in 1947.

The Leduc No. 1 well obtained production in a Devonian reef dolomite, called the D-2 zone, at a depth of just over 5,000 ft. Later on in the year, a stepout well encountered a second producing horizon in the D-3 zone, approximately 250 ft. below that established in the No. 1 well. This zone was also reefal in origin. Nearly 11 months after the Leduc discovery, a successful well was drilled in the Woodbend area approximately 3½ miles from the closest producing well at Leduc. Since that time, it has been shown that Leduc and Woodbend are parts of the same field.

Fig. 5 shows an east-west cross-section of Leduc field. Its upper half shows the formations penetrated in the drilling down to the two oil-producing horizons. The lower half shows an enlarged cross-section of the producing horizons in the Devonian. The D-1 carries only showings of oil and gas, with a considerable volume of water. The upper producing horizon is D-2, and the lower producing horizon is D-3. The D-3 horizon is a typical coral-reef formation. It grades latterly to the east into green shale, and thus limits production in that direction.

Fig. 6 shows development at Leduc.

Redwater field, located about 40 miles northeast of Edmonton and 60 miles from Leduc, was discovered in September 1948. Production was obtained at a depth of 3,200 ft. from a limestone reef, equivalent to the D-3 zone at Leduc. Early in its history, Redwater was recognized as North America's most important new field in 1948. Since then, extensions have made it one of the large fields of the continent with a length of 15 miles and a width up to 3 miles. (See Fig. 7.)

The most dramatic discovery in 1949 was that at Golden Spike, which has shown a maximum oil saturation in the D-3 of 595 ft. This compares with an average producing thickness of about 30 ft. at Leduc and 140 ft. at Redwater.

The Stettler discovery, with production in both the D-2 and D-3 zones, is of interest because it opens up a new potential producing area, some 100 miles southeast of Leduc field.

Only a few wells have been drilled in the other discoveries and their size and reserves therefore remain to be determined. The one of most significance, however, seems to be that at Normandville some 225 miles northwest of Redwater.

The Alberta discoveries have increased Canada's oil reserves from about 72 million barrels at the end of 1946 to about a billion barrels 3 years later. The Leduc reserves are estimated at 250,000, while Redwater is placed at 500 million. Due to the small number of wells drilled, it is difficult to make an accurate estimate for Golden Spike, but because of its thick producing zone, it seems reasonable to assume that it will be a major oil field of at least 100 million barrels. Thus the three largest of the recent discoveries have an estimated

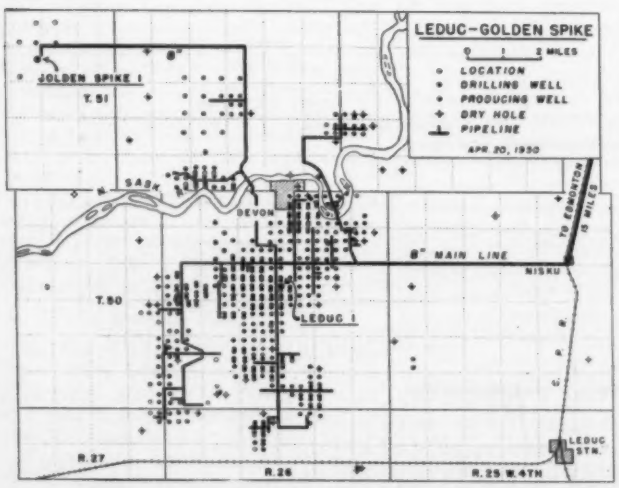


Fig. 6

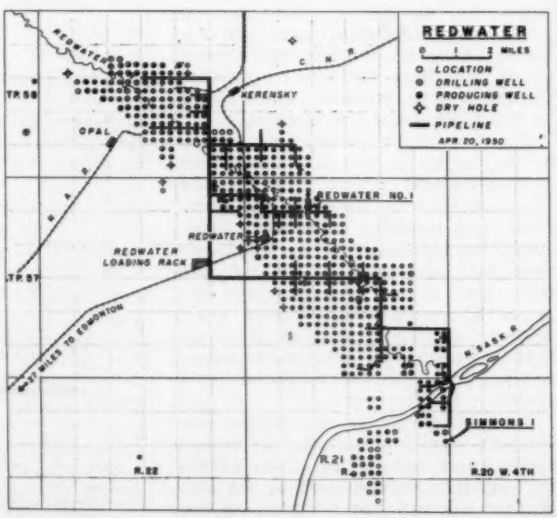


Fig. 7

total of 850 million barrels of recoverable oil.

A most important byproduct of the search for oil in the west has been the very substantial increase in natural gas resources. Gas reserves of western Canada are now estimated at about 7 trillion cubic feet. These reserves have a B.t.u. content just about equal to that of all of Canada's proven oil reserves. However, recent wildcat drilling activities have indicated the existence of a number of potential gas pools which may bring the total reserves to substantially more than the 7 trillion figure. At present, the gas is being used only to supply local markets.

Transportation Picture

The importance of the new oil discoveries to Canada is apparent. The prairie provinces are now self-sufficient, and Canada has a potential production equal to more than a third of her total requirements. However, because of transportation difficulties, western production has had to be prorated to about 65,000 bbl. a day, about half of the 125,000-bbl. potential. A quick glance at a map will serve to explain why. The problem of distance to markets, all too familiar in Canada's economic development, has yet to be solved. The Canadian prairies are primarily agricultural and are not heavily populated. And Alberta's oil fields are 2,000 miles away from the larger centers of population in the industrialized East.

Until pipe lines are available to carry Alberta crude beyond the prairie provinces which are its present economic limit, eastern markets cannot be tapped. The need for such a pipe line was recognized as a probability soon after the Leduc discovery and planning started on paper more than 2 years ago.

Interprovincial Pipe Line Co. has now begun work on a 1,180-mile line from Redwater to the Great Lakes, and completion is scheduled for late this year. The cost is estimated at some 90 million dollars. (See Fig. 9.)

The initial capacity of the Interprovincial line will be 95,000 bbl. a day to Regina and 70,000 bbl. a day east of Regina, with the delivery at Superior during the summer of 1951 expected to be between 50,000 and 60,000. However, by installing additional pumping stations, the line's capacity can be increased to a total intake at Edmonton of about 150,000 bbl. a day and to an output of 90,000 bbl. at the lake head. The pipe line will drop off, en route across the prairies, some 45,000 bbl. per day for adjacent refineries. On arrival at Superior, the oil will be transshipped by lake tanker to Canada's largest refinery at Sarnia and to other refineries in Ontario.

To assist in the movement from Superior, two lake tankers—almost twice the size of the largest now plying the lakes—are being constructed at a total cost of about 8 million dollars. Each will be able to carry more than 115,000 bbl. of oil on each trip, and more than 5 million barrels during a 7-month season of navigation.

Refineries

Present plans anticipate a supply to prairie refineries in 1951 of 29 million barrels of Alberta crude, of which 16 million barrels will be moved east of Edmonton by pipe line. A further 13 million barrels will be carried by pipe line and tanker to Ontario refineries. To accomplish this volume of movement to Ontario, 1½ million barrels will have to be accumulated during the winter at the lake head.

The annual demand of the Ontario refineries amounts to 24½ million barrels, which, together with the prairie demand of 29 million barrels, makes a total of 53½ million barrels or a daily average of 147,000 bbl. It is hoped that this entire market can be captured for western Canada crude. To do so involves an increase in the movement through Superior from the 13 million barrels planned for 1951 to 24½ million barrels. Sufficient reserves are available in the Alberta fields; the pipe-line capacity can be increased to handle the increased movement; but more vessels will be required to move the oil through the lakes. The problem thus is reduced to laying down crude at all the Ontario refineries on a price basis that will back out the crude from present sources—which is largely from Mid-Continent and Illinois fields. To do so will involve some reduction in the well price in Alberta, but this will be offset by the substantially increased market outlet.

To understand the significance to Canada of the western oil discoveries, it is necessary to have an appreciation of the increasing importance of petroleum to Canada and her dependence on foreign sources of supply.

Canada's per capita consumption of petroleum products, about 300 Imperial gallons, is the second highest in the world, surpassed only by the United States with 500. In the past 10 years, gasoline demand has doubled and heating oil has increased three and a half times. Consumption of all products over that period has increased 130 per cent, as compared with 77 per cent in the United States.

Today, by developing known fields, Canada could produce about one-half of all the oil she uses, and we talk in terms of possible self-sufficiency within a few years. On the basis of "years of supply"—a country's reserves divided by its requirements—Canada now has 9.4 "years of supply" compared with 13.5 years' supply in the United States.

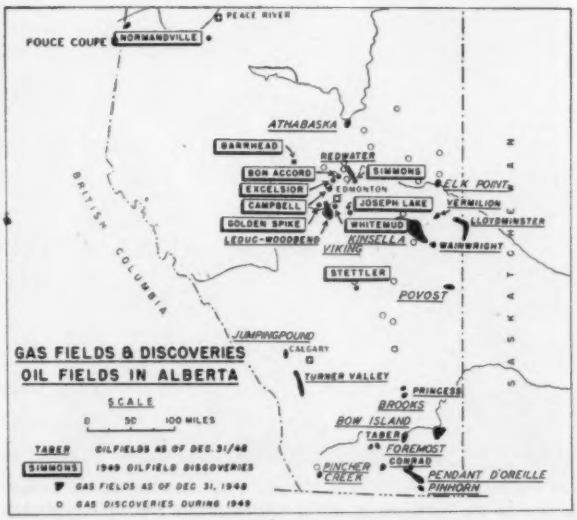


Fig. 8

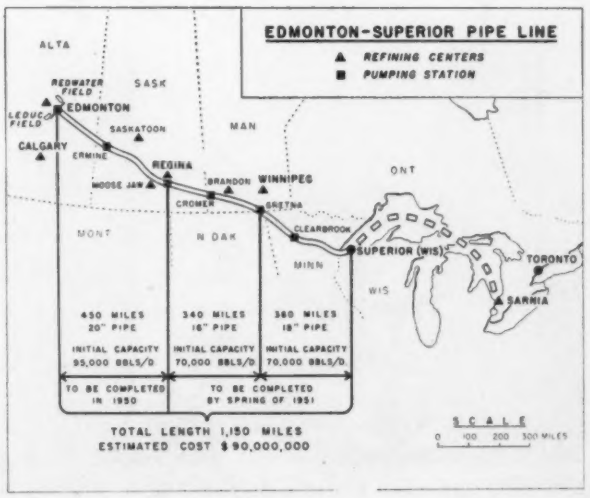


Fig. 9

XUM

NEW GAS-FUELED ALUMINUM PLANT.—Aerial view of Aluminum Co. of America's new multimillion-dollar plant on Texas Gulf Coast. Natural gas fuels 120 unique gas engine-generator units. The gas is received via special pipe line system from onshore and offshore wells.

END PRODUCT.—(Circle) Workmen are pouring molten aluminum into pig form (annual capacity 114 million pounds).

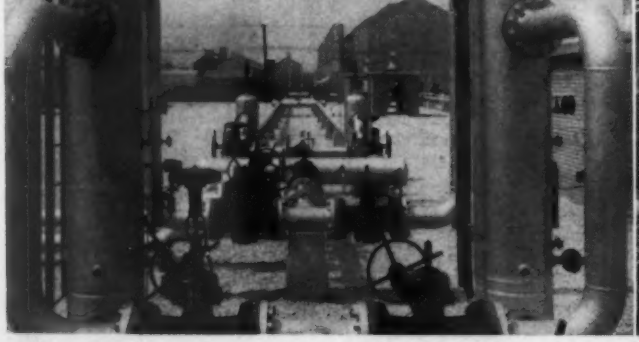
Alcoa's New Plant Uses

by Leigh S. McCaslin, Jr.
District Editor

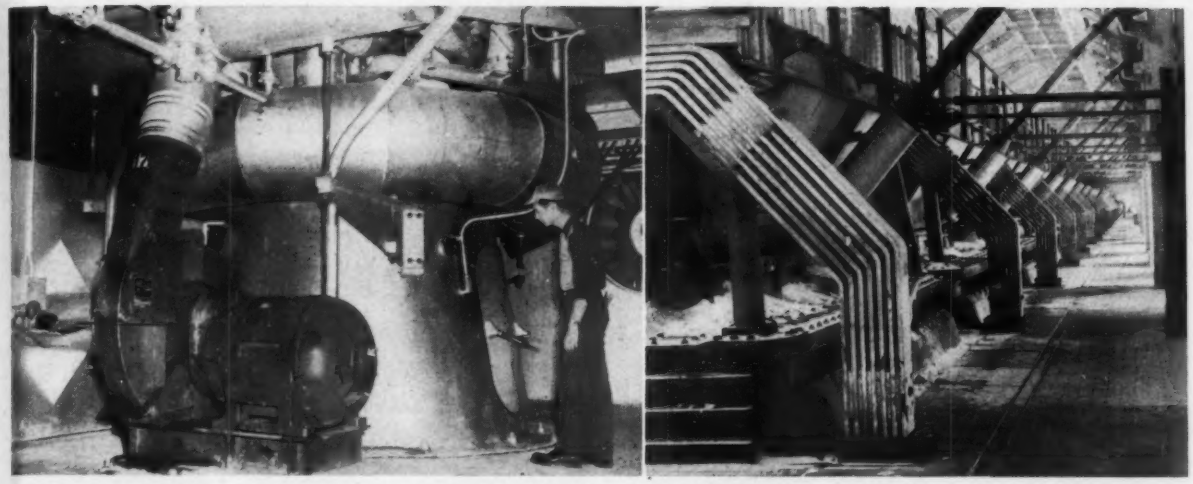
GRADING and excavation for Aluminum Co. of America's Point Comfort Works began in August 1948. The first aluminum ever made in Texas was poured at the works on February 11, 1950. Aluminum is made by the electrolytic reduction of aluminum oxide. This reduction or "smelting" process is the operation carried on at the Point Comfort Works, which can produce about 114,000,000 lb. of aluminum per year.

Point Comfort Works, located on a tract of 3,000 acres on Matagorda Bay near Port Lavaca, Tex., consists of 25 buildings with approximately 18½ acres of floor space. Included among these buildings are the pot rooms where aluminum is made; the engine rooms for the production of electric power necessary for making aluminum; a carbon plant; and various plant service facilities.

The covering of the production buildings represents the largest single application of aluminum industrial corrugated roofing and siding to date. Among the many other applications of aluminum found at the works are the fence, lamp poles, electrical con-



INCOMING GAS.—(Left) Arrives at the plant from the producing fields at a pressure of from 400 to 500 psi. This reducing station brings the pressure down to 60 psi. in two stages. Part of the main plant can be seen in the background. NEW RADIAL-TYPE ENGINES.—(Right) One of the three engine rooms, each containing 40 gas engines, which produce a total of 192,000 hp.



VERTICAL GENERATOR.—(Left) In center rear of photo appears one of the 120 electric generators, each supplying 1,000 kw. of d.c. power for the electrolytic reduction of aluminum oxide to aluminum. ELECTROLYTIC CELLS.—(Right) Portion of "line" of these units.

Natural-Gas Power Source

ductors, doors, windows, lighting fixtures, and trim and decorative effects.

A concrete-and-steel dock was constructed at the works. A channel, complete with turning basin, connects the dock with the Pass Cavallo-Port Lavaca channel. The Point Comfort and Northern Railroad, a subsidiary of Alcoa, owns 14 miles of track between the plant site and Lolita, Tex., where a junction is made with the Missouri-Pacific line.

Use of Gas Is New

Except for short periods during World War II and the early days of the industry, hydroelectric power has always been used for the production of aluminum in Alcoa's plants. Water power has been used because it was a good source of low-cost electricity in the large amounts required by the aluminum industry. Since about 10 kw.-hr. of electricity are used for every pound of aluminum produced, a reduction plant requires a large amount of power. In recent years, it has become increasingly difficult to secure large quantities of power because of growth of population and industry in hydroelectric areas and because the Government has preempted most of the remaining water sites of any consequence. For this reason, the aluminum industry is constantly on the alert for new power sources.

One alternate source of electric power is coal. There are several fac-

There are five major points of interest to the oil and gas industry in connection with the recently completed multimillion-dollar plant of Aluminum Co. of America on the Texas Gulf Coast.

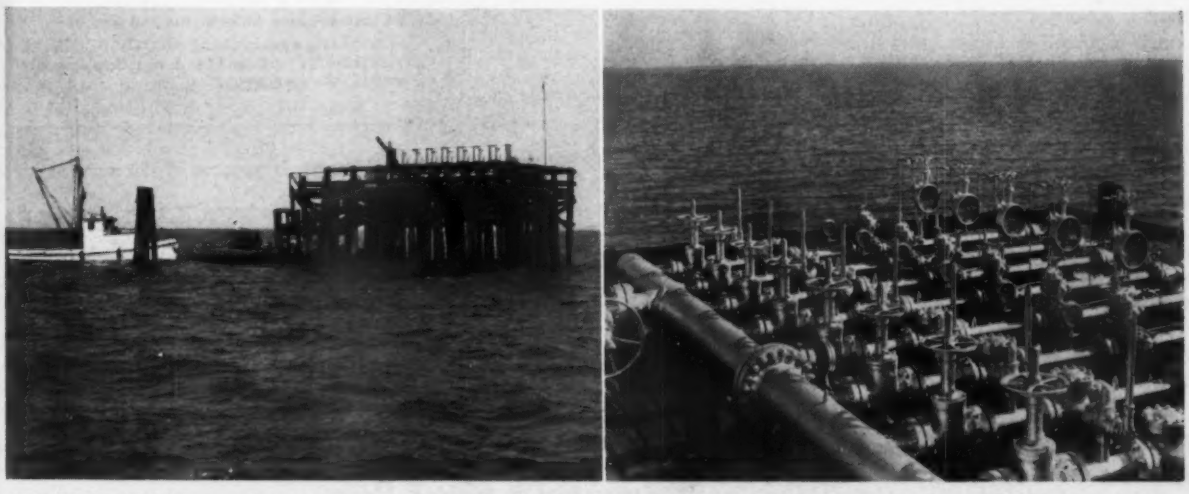
1. The plant is utilizing natural gas as its basic power source in preference to hydroelectric power which has been traditional in the industry.

2. It will be one of the largest internal combustion engine plants in the world with an output of 192,000 hp.

3. Four thousand feet of 4-in. aluminum pipe has been laid for an experimental gas-gathering line.

4. Underwater gas lines consisting of 21½ miles of 4, 6, and 8-in. pipe have been laid in Lavaca and Matagorda bays.

5. One hundred and twenty 1,600-hp., 11-cylinder, radial-type engines of a new design are being used for power generation.



GAS FIELD.—(Left) Source of part of the gas used at Alcoa's plant is an underwater field in Matagorda Bay. GAS CONTROL.—(Right) This picture shows the gas control and metering platform; this platform also is located out in the waters of Matagorda Bay.

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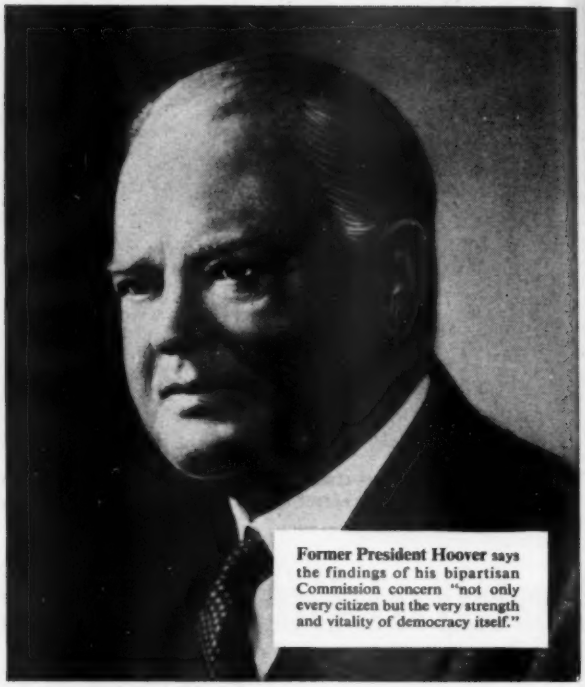
President Truman writes the *Citizens Committee for the Hoover Report:* "Results... will be disappointing unless some educational program is put on . . ."



Former President Hoover says the findings of his bipartisan Commission concern "not only every citizen but the very strength and vitality of democracy itself."

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tors which make the adoption of coal uneconomical for the production of aluminum. In the first place, the supply of coal is not dependable. Secondly, its use would raise the cost of power as compared to other fuels. Finally, the efficient application of steam from coal for power generation makes it more readily adaptable to producing alternating electric current. Since alternating current would have to be rectified, the use of steam in an industry requiring dependable, low-cost, direct current is not very practical.

Another source of electric power is gas. Alcoa had experience with gas in the early days of the company. As late as 1915, several gas engines were used at Alcoa's plant in New Kensington, Pa. These relatively inefficient engines turned d.c. dynamos. During World War II, Alcoa designed, built and operated the Jones Mills, Ark., plant, owned by Defense Plants Corp. In this plant, internal-combustion engines using a fuel composed mostly of gas were employed for the production of d.c. power.

Vertical Shaft, Radial Engine

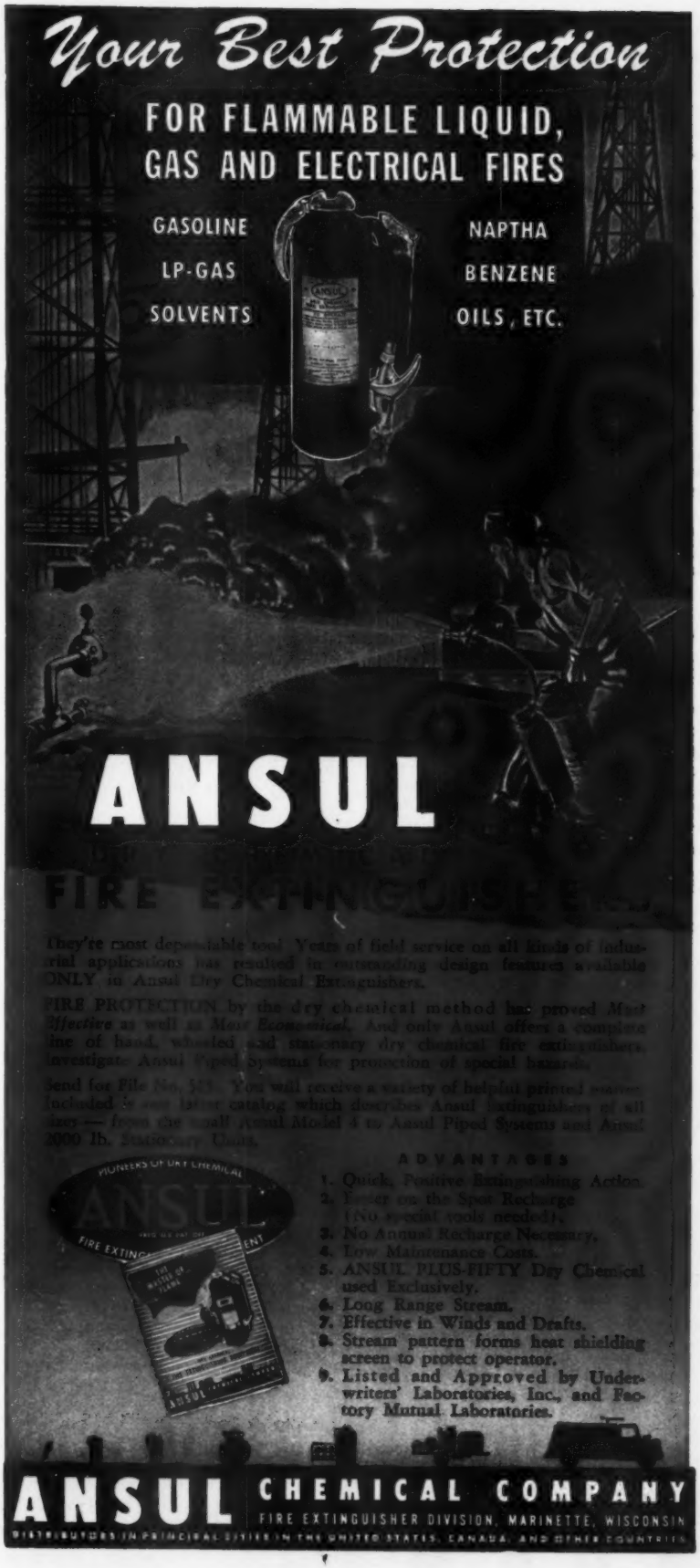
Experience with gas at Jones Mills led Alcoa to believe that there might be some important possibilities in more general use of gas as a source of power. Alcoa's chief electrical engineer, D. I. Bohn, conceived the idea of using a vertical-shaft, radial engine. In a cooperative agreement with Alcoa, Nordberg Manufacturing Co. proceeded to build a model of the now-operating Point Comfort engine. This experimental model was tested for several years at Alcoa's plant in East St. Louis, Ill.

Success of the test model led to the building of a reduction plant using gas as a source of power. Naturally, there was considerable exploration work in choosing a suitable site for the plant. In addition to an uninterrupted supply of low-cost natural gas, it was desirable that the plant site be close enough to water that it could be reached by barges; that the ground be high enough to avoid flooding; that the site be handy to rail and highway facilities; that there be a sufficient supply of fresh water; and that an adequate labor supply be available. The Matagorda Bay area seemed to answer these requirements.

Lavaca Pipe Line Co., a subsidiary of Alcoa, was organized for the purpose of operating the pipe line necessary for gathering and distributing the gas to be used in the works.

Gas is received from both onshore and offshore wells. One pipe line, built in the fall of 1949, runs between the Point Comfort Works and Francitas Gas Co.'s recycling plant near Francitas, Tex. There are approximately 11 miles of 10-in. pipe and 5½ miles of 8-in. pipe in this line.

Another line, consisting of 7½ miles of 8-in. pipe, ties into the offshore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line in Matagorda Bay.* The main underwater line, in Lavaca and Matagorda bays, consists of approximately 14 miles of 8-in. pipe, about 12½ miles of it under water. In addition, approximately 9 miles of 4 and 6-in. pipe are used for the offshore gathering lines. The average depth of water in the gas field is about 14 ft.

One experimental gathering line consists of about 4,000 ft. of 4-in. aluminum pipe instead of the steel pipe used for the rest of the system. One half of this aluminum line was left bare and the other half was wrapped in the usual way.

At the present time, Alcoa Mining Co., a subsidiary of Aluminum Co. of America, is participating in drilling with others and doing some drilling of its own. This is being done to insure and adequate supply of gas, essential to any long-term plans for the Point Comfort Works.

It is not yet possible to compare the cost of hydroelectric power with that secured from gas. Some believe that the cost of power from gas will never be as low as that which the aluminum industry is accustomed to paying for hydroelectric power.

At present, Point Comfort's power is costing more than the figure Alcoa hopes to reach after the plant has been shaken down. Maintenance in the power plant is naturally running higher now than it will later on. Periodic test disassembly of the engines, for example, should be done less frequently in the future. In addition, it was necessary to start with inexperienced crews. Thus, it will be some time before peak operating efficiency is reached.

Other factors besides the actual cost of the gas affect the ultimate cost of power delivered to the pot rooms. For example, the pipe lines to get the gas from the wells to the plant were expensive. So far, almost 50 miles of pipe have been laid in the gas-gathering and distribution system.

The lack of flexibility of gas-generated electric power must also be considered. Hydroelectric power can readily be sold; steam-generated power can be shut down at a minimum cost in times of low business cycles, hurricanes, and labor or other difficulties.

Then there is the problem of water. The plant was built on ranch land where some artesian wells had been drilled. The solids content of this water was too high for use in the engine coolers, however, and was also unsatisfactory for other plant purposes. Consequently, test wells had to be drilled, and water is now secured from wells 9 miles from the plant.

In addition, taxes on natural gas must be considered. There has already been one tax increase on gas production since Alcoa has been in Texas. In the long run, the continued use of natural gas as a source of power for the production of aluminum will depend directly on the net cost, including taxes, of large quantities of gas secured by long-term contracts.

*See "Lavaca Offshore Gas Pipe Line," by Paul Reed, The Oil and Gas Journal, November 4, 1948, page 96, for a detailed discussion of this project.

Power Supply

The gas which Alcoa uses as a power source is converted into the electric power required to make aluminum by means of generators driven by internal-combustion engines. It takes about 10 kw.-hr. of electricity to produce 1 lb. of the metal.

Natural gas is delivered to the works at a pressure of from 400 to 500 psi. This pressure is reduced in two stages to 60 psi. Two 8-in. gas lines connect each of the three power houses with the pressure-reducing station. A regulator at each engine further reduces the intake pressure, and in actual operation, gas enters the engine at a pressure of about 6 psi.

Each engine consumes gas at a rate of 13,000 cu. ft. per hour under load. Normally, the plan will use more than 30,000,000 cu. ft. of gas per day.

Nominal generating capacity of the power plant is 120,000 kw. Under normal operating conditions, the total output of the plant will be approximately 2,750,000 kw.-hr. per day.

Gas Engines

One hundred twenty engine-generator units convert the gas into electrical energy. Forty units are housed in each of three engine rooms, one for each pot line.

The engines are a two-cycle, radial-type, built by Nordberg Manufacturing Co. With slight modifications, the engine can be adapted to gas, diesel fuel, or dual-fuel operation.

The 11-cylinder engine has a 14-in. bore and a 16-in. stroke. At Point Comfort, the engines are normally operated at 360 r.p.m., producing 1,600 hp. They operate at a thermal efficiency of about 29 to 30 per cent.

The crankshaft is set vertically with the crank at the top. The cylinders are bolted radially to a cast frame, having a central hub that carries both the lower crankshaft main bearing bushing and also the thrust bearing which supports the load of the crankshaft. The heavy, bolted cover contains the upper crankshaft main-bearing bushing. The governor, fuel pumps, mechanisms for gas operation, and controls are located on this cover. Circular manifolds for scavenging and exhaust are located in the lower level of the engine room. Intake and exhaust are timed by the pistons uncovering ports in the cylinder walls, and no valves are required.

Balanced operation is accomplished by use of a master gear, a stationary gear bolted to the cover, two pinions, and rotating counterweights. The 11

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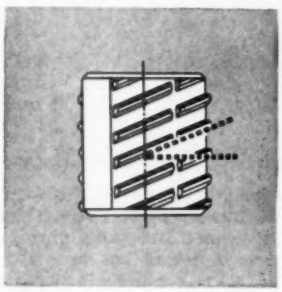
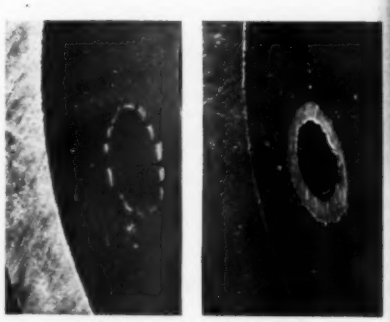


Reversible Cutter

Tool design and construction is simple and maintenance is easy. Each cutter is held against the casing by three strong coil springs, which exert an even pressure between cutter and mandrel.
The helical teeth on the four opposed, spring loaded cutters produce shearing action which cleans casing quickly, cutting away all burrs or foreign material. Reversible cutters give extra service life.



Perforation Burrs Removed Cleanly

Unretouched photograph of gun perforation before and after removing burrs with Security Casing Scraper. Photo on right shows burr is actually cut (sheared) away, not crushed or broken. For economical scraping, specify Security.

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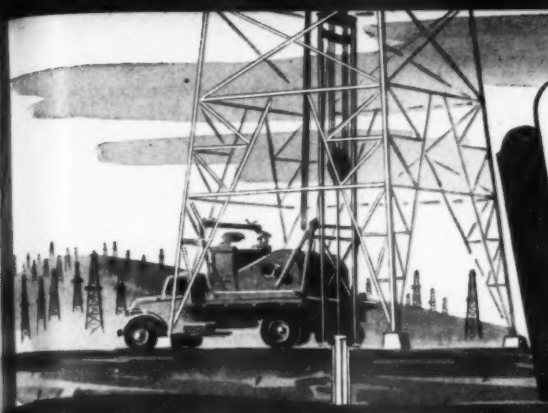
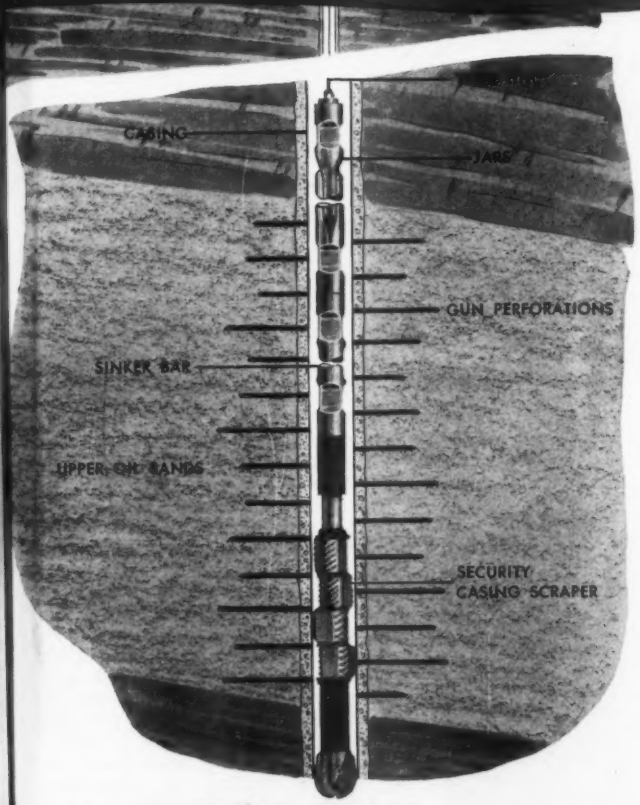


LOCATION: Lake Creek

WELL HISTORY: Depleted production required recompletion at upper pay zone. Gun perforated at 10,000 feet opposite new pay.

PROBLEM: Economically scrape casing perforations without rotary equipment.

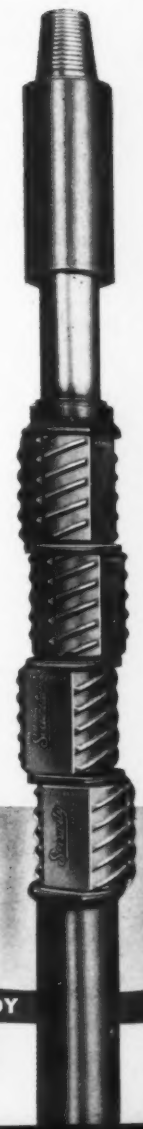
How would you Scrape Casing Without a Rotary?



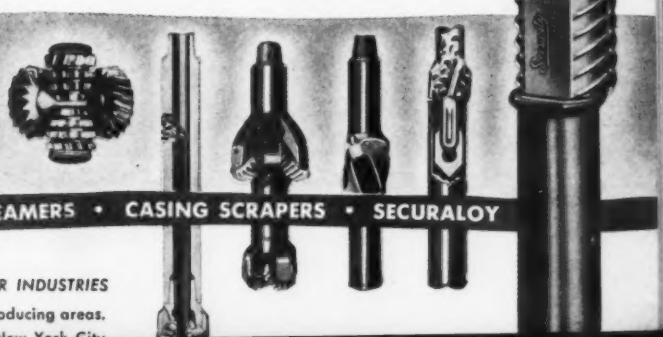
The production superintendent of a large oil company was faced with the problem of scraping 7" casing which had been gun perforated with 150 holes at a depth of 10,000 feet. The only work-over equipment on the job was a small pulling unit backed up to the standard derrick.

The only way he could solve the problem, without moving in rotary equipment, was to run a Security Casing Scraper on wire line. He ran a 7" Security Scraper on 5/8" wire line with a sinker bar above the Scraper and a set of jars above the sinker bar. The scraper was run up and down through the gun perforated section. Only three hours were consumed in this operation, including running in and out of the hole. Packers were run through the scraped section and set without difficulty.

This is a typical example of how the Security Casing Scraper can reduce your work-over costs because it is the only Scraper which does a complete job when run on drill pipe, tubing or wire line. Call your Security Field Representative when you are ready for your next scraping job.



Security



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connecting rods are attached to the master gear by means of knuckle pins mounted in bronze bushed bearings. The master gear gyrates instead of rotating. There is no master connecting rod, commonly associated with radial-type engines.

Two systems of lubrication are used. Motor driven, multifeed lubricators deliver oil to each cylinder for piston lubrication. A circulating, pressure system provides oil for all other parts requiring lubrication and also for piston cooling.

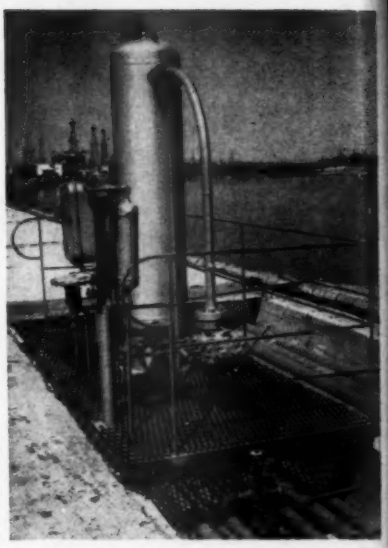
When set up for gas burning, the engine operates on reduced compression, with spark ignition. Natural gas is admitted by cage-mounted gas valves. The valves are operated by a cam on the crankshaft and are so located that gas is admitted into the path of incoming scavenging air. This assures thorough mixing and efficient use of the fuel. A valve inserted in the gas line and controlled by a governor varies the amount of gas delivered to the cylinders according to the load on the engine.

Generators

The electric generators are located in the lower level of the power houses and are joined to the engines by direct coupling. Each engine generator unit, with its auxiliaries, operates independently. Forty generators were supplied by each of three manufacturers: Elliott Co., General Electric Co., and Westinghouse Electric Corp.

Each generator produces 1,000 kw. (d.c.) at 667 volts and 125 kva. (a.c.) at 425 volts and 24 cycles. The a.c. power is used for driving the engine auxiliaries. This eliminates the need for a common auxiliary power system and possibility of a total station interruption.

The generator is used as a motor in starting the engine.



End view of separator unit showing frame construction for base and method of supporting unit over pipe trench while the well is being tested.

OPERATING IDEAS

"Unitized" Test Separator

RICHFIELD OIL CORP. uses an ingeniously engineered "unitized" test separator, for gaging oil and gas production from individual wells in the Harbor area, Wilmington field (Long Beach), California. These wells are drilled in special "group" formation or pattern, and they can be tested as frequently as desired for individual production of oil and gas with this unitized separator setup, which contains all the instruments and connections necessary for such work. In the case of a series of wells drilled by directional methods so as to consolidate surface equipment, this type of test separator is valuable.

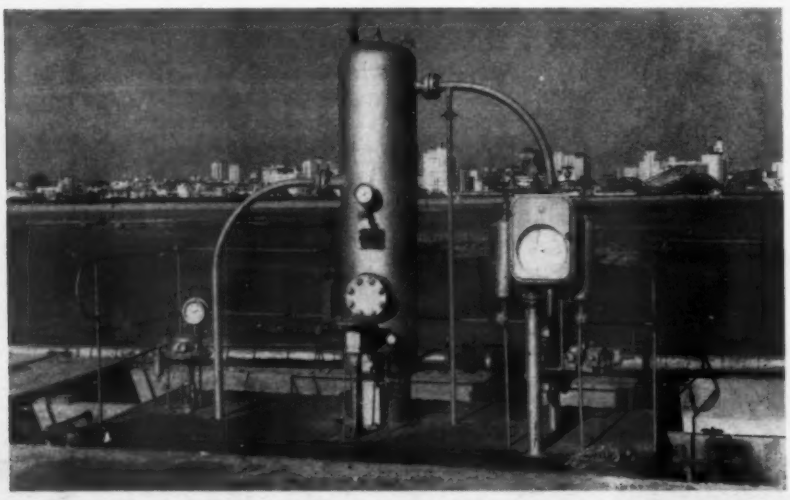
All production piping and transfer lines are installed in a concrete-lined compartment paralleling the casing heads and christmas trees. All lines are supplied with taps, valves, and bypasses opposite each well so the separator assembly can be connected in a uniform manner. Single wells spaced on regular patterns have similar connections so the separator can be connected to the piping without modification.

The separator is 20 in. o.d. by 6 ft. high, fabricated for a working pressure of 1,000 psig. It is installed on an all-steel substructure with the skirt of the separator bolted to the sills in a position for maximum balance of the unit weight, for convenience when lifting from the setting at one well with a motor crane or truck and moving to the next location for subsequent tests.

The substructure is approximately 8 ft. long and 4 ft. wide, built with an adequate number of structural-steel sills to support the equipment mounted upon the substructure. Side sills are I-beams and the ends are faced with angle iron to supply an anchor for the steel grating floor, trimmed and burred to remove "wickers." A neatly constructed hand rail is bolted to each end and the back side of the separator to provide security for the men performing production tests.

The pipe line which receives the mixture of oil and gas from the well is fitted with a pressure controller. Fluid produced by the well passes out of the separator through a self-contained liquid-level controller to which the unitized production line is attached. A retractable orifice fitting is installed on the separated gas-transfer piping, beneath the recording orifice meter. Indicating pressure gages are attached to the separator and on the incoming production line for instant reading of production conditions.

Flanges are provided on the inlet and outlet piping so the unit can be attached to the taps in the various lines without cutting pipe or supplying extra nipples and fittings. The complete setting can be moved quickly by looping slings around the inlet and outlet nozzles of the separator itself and using a truck boom with a power winch, or a motor crane if available.



INDIVIDUAL WELL TESTS.—Richfield Oil Corp. uses this equipment arrangement in Harbor Area, Wilmington (city of Long Beach in background). Separator is 20 in. by 6 ft. equipped with recording orifice meter, retractable fitting, pilot-type pressure regulator.

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L.P.G. Production at Sinclair's Marcus Hook Refinery

by H. F. Thompson*

SINCLAIR REFINING CO. recently has placed a new L.P.G. unit on stream at its Marcus Hook refinery, which has a capacity of 1,100 bbl. per stream day of liquefied propane gas. Construction of this unit, which was designed and built by Sinclair personnel, was started on July 1, 1949, and since going on stream March 1, it has been operating continuously.

Currently the plant is producing an extremely dry, low-olefinic-content L.P.G. product which meets all N.G.A.A. specifications for commercial propane. The new operation at the Marcus Hook refinery was undertaken to meet the ever-increasing demand for liquefied petroleum gas in the North Atlantic seaboard area.

Details of Refinery L.P.G. Unit

The butanes and lighter hydrocarbons are recovered from cracked distillated stabilization operations and treated in sequence with diethanolamine and caustic solutions for the removal of hydrogen sulfide and mercaptans. This hydrocarbon stream is then subjected to a high-pressure (1,000-psig.) catalytic polymerization operation wherein 85-90 per cent of the propylene-butylene content is reacted.

The propane and lighter hydrocarbons stream from the polymer depropanizer are charged via gas-driven reciprocating compressors to a 20-tray deethanizer which fractionates out 85-90 per cent of the propylene-propane content of the charge for L.P.G. sales. The composition of feed, overhead, and bottom streams of the deethanizer operations are as shown in Table 1.

TABLE 1—FEED AND YIELD DATA

	Feed (mol. %)	Release gas (mol. %)	L.P.G. (Liq. %)
Methane	4.8	10.2	....
Ethylene	4.7	10.5	....
Ethane	29.9	65.5	0.5
Propylene	4.6	2.0	4.0
Propane	56.2	11.8	95.5
	100.0	100.0	100.0

Refrigeration Is Employed

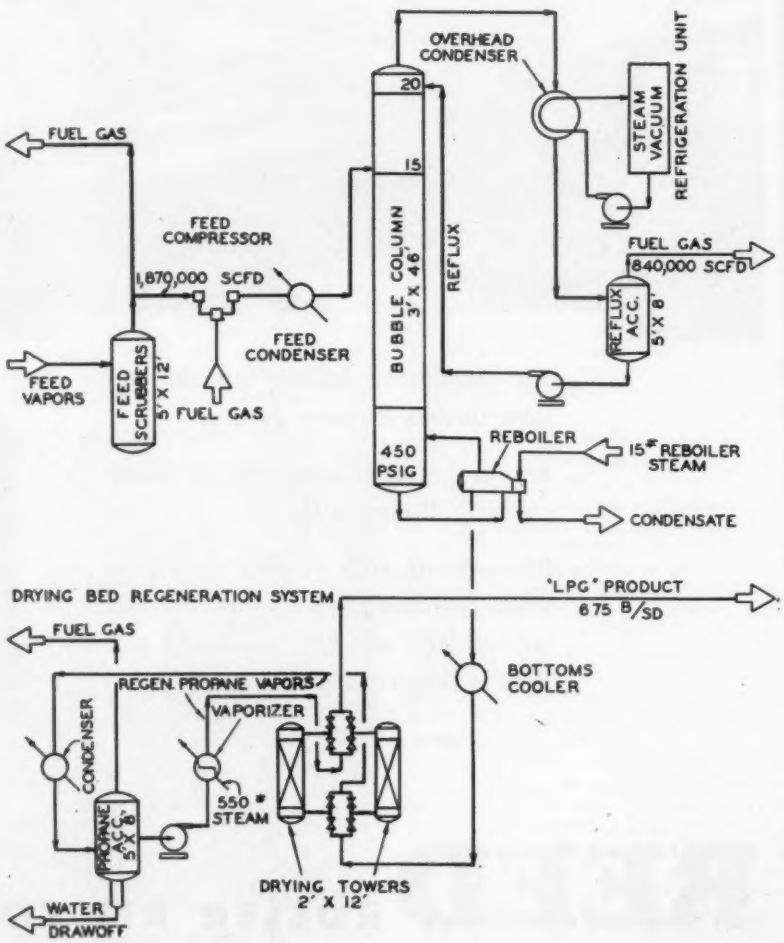
A 126-ton per day capacity steam-jet refrigeration unit is used during the warmer months of the year to provide 50° F. cooling water for the reflux condenser of the deethanizer. A stuffing-boxless type centrifugal pump has given trouble-free operation in this rather difficult deethanizer reflux service.

In order to prevent "frosting" of the overhead release-gas pressure-control valve and the downstream line therefrom, an all-welded shell-and-tube steam heater is installed between the gas outlet from the reflux accumulator and this gas release valve. L.P.G., the bottoms product of the deethanizer column, flows on level control from a cooler through an activated alumina drying tower and thence into "bullet-type" storage vessels. Three such vessels of 600-bbl. capacity each have been provided along with tank-car and truck-loading facilities.

Regeneration of the alumina is accomplished by stripping the adsorbed water from the drying beds with 350° F. propane vapors. A closed system is employed from the regeneration of the alumina beds and consists essentially of a propane accumulator, a small centrifugal circulating pump, a vaporizer in which 550-psig. steam is used for vaporization and superheating and a water-cooled exchanger to condense the propane and water-vapor effluent from the drying bed.

The water desorbed from the drying bed separates out in the accumulator and is withdrawn from a well at the bottom of the accumulator. The towers are currently on a 24-hour drying cycle with regeneration now being accomplished in 6-12 hours.

General design and current operations of this unit are as shown in the accompanying flow diagram.



Flow diagram of general design and current operations of Marcus Hook unit.

*Chief, technical department, Sinclair Refining Co., Marcus Hook, Pa.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Gasoline Content of Crude Oils

We have heard that the gasoline content of crude oils is about equal to the gravity. Is this a good average? F.M.C.

A gasoline content that is numerically equal to the A.P.I. gravity is perhaps as good a simple approximation as can be had. It is not at all accurate, however, because low-gravity crude oils contain much less gasoline and high-gravity crudes (50 and up) contain much more gasoline. In fact no simple statement of the relationship between gasoline content and A.P.I. gravity is accurate.

The average gasoline content is plotted against crude-oil gravity in Fig. 1. The curves for California crude oils were taken from the article entitled "California Crude Oils" by Mithoff, MacPherson and Sipos, *The Oil and Gas Journal, November 6, 1941, page 81.* The Venezuelan crude

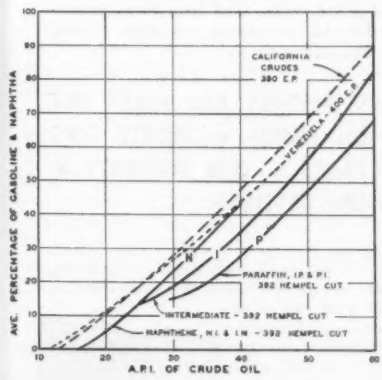

AVE. PERCENTAGE OF GASOLINE & NAPHTHA
A.P.I. OF CRUDE OIL
CALIFORNIA CRUDES 390 E.P.
VENEZUELA - 400 E.P.
PARAFFIN, I.P. & P.I. 392 HEMPEL CUT
INTERMEDIATE - 392 HEMPEL CUT
NAPHTHENE, N.I. & I.N. - 392 HEMPEL CUT
N
I
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Fig. 1—Average but approximate relationship between crude-oil gravity and gasoline content.

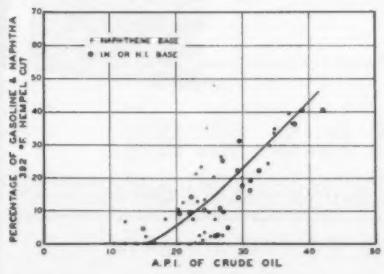

Fig. 2—Average gasoline and naphtha content of naphthene, intermediate-naphthene, and naphthene-intermediate-base crude oils.

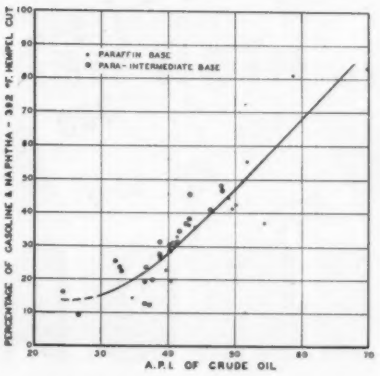

Fig. 3—Average gasoline and naphtha content of paraffin and paraffin-intermediate-base crude oils.

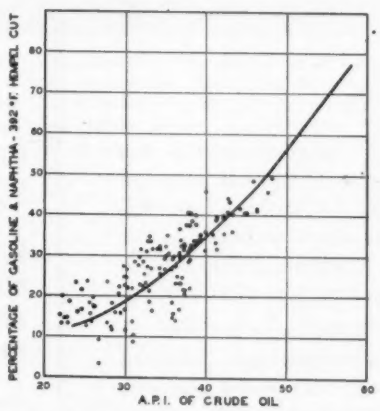

Fig. 4—Average gasoline and naphtha content of intermediate-base crude oils.

data were taken from 28 true-boiling-point distillations. The three curves for naphthene, intermediate, and paraffin-base crude oils as averages taken from Bureau of Mines Hempel analyses, particularly R.I. 4289 "Analyses of Crude Oils from 283 Important Oil Fields in the United States."

The curves for California and Venezuelan crude oils are for A.S.-T.M. end points of 390° and 400° F., respectively, but the Bureau of Mines curves are for 392° F. Hempel cut points. This probably accounts for the relatively low position of the curves derived from Bureau of Mines analyses. It can be clearly seen that each base of crude oil or the crude oils from any particular region, each exhibits a particular relationship between A.P.I. gravity and the gasoline content.

Even the averages shown in Fig. 1 cannot be trusted completely because individual crude oils all of the same gravity, vary widely in gasoline content. This is clearly evident in Figs. 2, 3, and 4 and is also evident in the California data presented by Mithoff et al. Thus for crude oils of 30° A.P.I. gravity, the gasoline (392° Hempel cut) contents overlap about as follows:

	Range per cent	Average per cent
Naphthene base	7-32	23
Intermediate base	8-28	18
Paraffin base	10-28	15

As more and more analyses are made, the situation becomes increasingly confused. Bureau of Mines analyses were analysed in 1930 and at that time three distinct regions for the three main bases of crude oils were found. It is evident from Figs. 2, 3, and 4 that no such clear relationship now exists.

Composition of Ethyl Fluids

What is the composition of tetraethyl lead?—S. M. P.

The compositions of fluids, according to Ethyl Corp. (June 14, 1946), on a per cent by weight basis are:

	62-mix	1-T aviation
TEL, 100 per cent	61.48	61.41
Ethylene dibromide	17.86	35.68
Ethylene dichloride	18.81	None
Dye, kerosine and impurities	1.85	2.91

Another mix known as 1½-T is somewhat experimental.

Some other factors are:

	62-mix	1-T aviation
Specific gravity, 20° C.	1.587	1.742
Freezing point, °F.	—28	14.8
Flash point, open cup, not below, °F.	245	222
Flash point, closed cup, °F.	75	....

Compression Ratio and Octane Number

What octane number of fuel is required for an engine that has a compression ratio of 7.7?—P. R. C.

The approximate relationship between octane number and compression ratio is:

Compression ratio	Oct. No. (research) required
7.5	89
8.0	93
9.0	96
10.0	99
12.5	102

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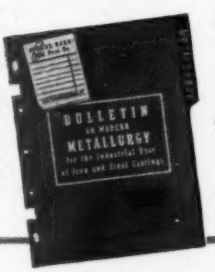

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Effect of Temperature, Pressure, Standoff upon

PERFO-JET PENETRATION

by J. E. Reed* and F. F. Carr*

THE pressures and temperatures encountered in oil wells have no effect upon penetration obtained by the shaped-explosive-charge method of well perforation, or rather none which can be measured. The pressure of the expanding gases exerted by the jet appears to be so great that it renders insignificant the resistance due to pressure in the narrow fluid-filled interval existing between the face of the jet port and the casing target.

The standoff distance, the distance interval in which the jet must move before it strikes the target, does have measurable effect upon the jet penetration, although not as much as might be imagined. These conclusions have been reached following the completion of studies of Perfo-Jet penetration, by Dowell Incorporated at its Tulsa research laboratories. The tests upon which the studies were based were made under fluid and at varying conditions of pressure, temperature, and standoff.

These experiments were conducted in Dowell's high-pressure, temperature-controlled test well. The well consists of a tube 26-ft. long, with 6⅝-in. laminated steel walls and an inside diameter of 15⅛ in. This tube is surrounded by an insulated shell containing controlled electrical resistance units for regulating the temperature in the well.

Fluid pressure within the well is supplied by an air-operated, high-pressure pump. The equipment is constructed to withstand pressures as high as 15,000 psi., and temperatures up to 350° F. Both the pressure and temperature are controlled and recorded at an instrument panel on the surface near the well head.

*Dowell Incorporated, Tulsa.

The Perfo-Jet gun assembly, containing a singe 21-g. shaped charge, was arranged so that the force of the jet was directed down. The required number of ½-in. steel plates was held in a cage suspended below the gun assembly in such manner that the distance between the charge and the uppermost test plate could be varied in order to observe the effect of the three factors, temperature, pressure, and standoff, on the depth of penetration of the jet into the target. The gun-and-target assembly then was run into the well.

After the well was sealed, the pressure was raised to the required level by pumping fluid into the well. The shaped charge then was detonated electrically, following which the pressure on the well was released and the gun and perforated test plates were removed from the well for inspection. These steps were followed for each run of the gun throughout the series of tests, varying the temperature, pressure, and standoff in accordance with the experimental program.

Fig. 1—All perforating tests were made using targets consisting of a number of mild steel plates ½ in. thick. The group shown above were used in one firing test. Perforations were made by firing a 21-gram shaped charge at a standoff of 1 in. Total penetration in this test was 3½ in. with the eighth plate indented slightly by the force of the jet. The score for this test, as explained in the paper, was 3½+.

In Fig. 1 is shown a group of the perforated test plates which were employed in the testing procedure. The penetration of the jet into the ½-in. steel plates was recorded to the nearest half inch, for the purpose of these tests. If the jet made any appreciable penetration into the next plate in the test assembly, this was recognized by a plus (+) sign. For example, the group of plates in Fig. 1 was scored 3½+.

The results of tests made under varying temperatures are plotted in Curve A of Fig. 2. There were 10 tests made in which the temperature was varied between 80° and 200° F. The pressure and standoff in these tests were kept constant at 7,500 psi. and 1 in., respectively. From the curve it is seen that the temperature had no apparent effect upon the jet penetration.

There were 21 tests made in which the pressure was varied from 0 to 10,000 psi., while the temperature and standoff were kept constant at 150° F. and 1 in. standoff, respectively. These data are plotted in Curve B of Fig. 3 and demonstrate that the pressure had no measurable effect on the depth of penetration obtained with the Perfo-Jet.

The effect of standoff upon the jet penetration is shown in Curve C of Fig. 2. In this series of 26 tests the standoff was varied from 0 to 8 in. The curve shows that over 2½ in. of penetration was obtained when the standoff was kept below 2 in. No attempt was made to run this particular series of tests under high pressure as data obtained earlier (Curve B of Fig. 2) already had demonstrated the pressure effect. The temperature during the series also was considered not to be a factor, although for convenience it was maintained at 150° F.

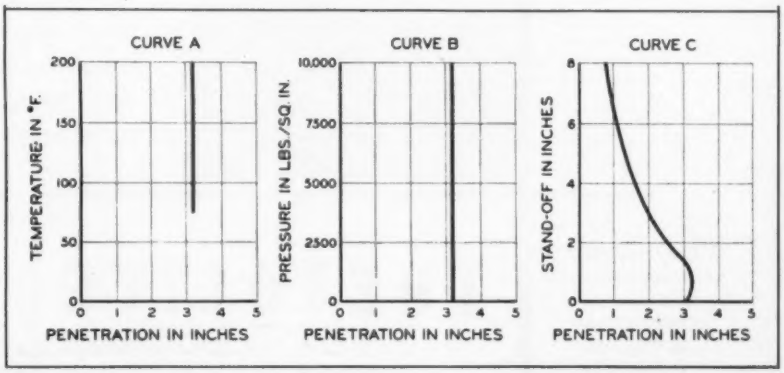

Fig. 2—The three curves above represent a large number of firing tests under varying conditions of pressure, temperature, and standoff. In Curve A, data are plotted to show that temperature has no effect on jet penetration. Curve B emphasizes that pressure has no measurable effect on jet penetration. In Curve C, the importance of standoff vs. penetration is illustrated. Over 2½ in. of penetration is obtained when the standoff is kept below 2 in.

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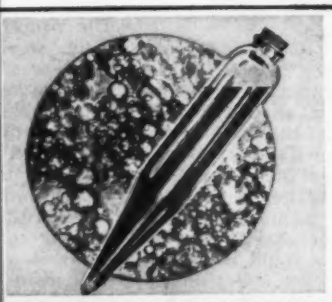

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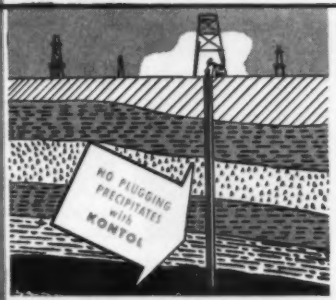

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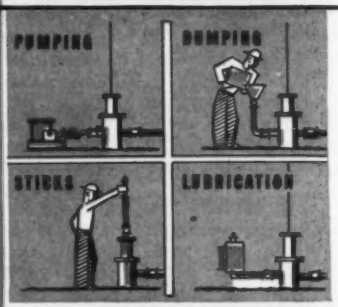

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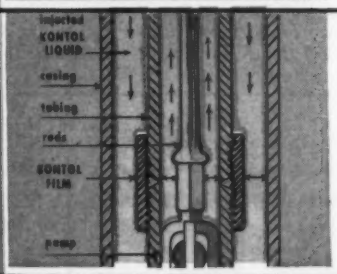

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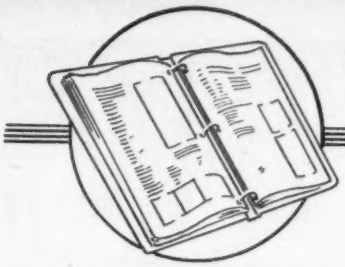


THE REFINER'S notebook

Interconnected Control and Derivative Action

PROPORTIONAL controllers are suitable for many applications in refinery processing. Most control problems encountered in the refinery can be handled satisfactorily by proportional-plus reset instruments. The use of a more complex single instrument, incorporating also the derivative or rate function, is relatively rare and more costly but may be desirable under certain conditions. The use of interconnected control, even though it means that one or more extra instruments must be purchased, is of advantage under certain conditions.

What do we mean by the phrase "under certain conditions?" In making a systematic approach to the subject of interconnected control, Pellettere[2] has tabulated some factors that make this method of control necessary or desirable. These include in particular: (1) Existence of lags and load change, (2) unfavorable reaction curve, and (3) need for close control of product quality.

Lags and load change.—Process and instrument lags may be related in a complex manner to load changes. Existence of unfavorable lags and load change result in instability, with fluctuations on the demand side of a controlled system and secondary fluctuations on the supply side. Instability in a process may necessitate the use of a three-function (proportional-plus, reset-plus rate) instrument or of interconnected instrumentation.

Recovery curve.—In dealing with controller characteristics (No. 26 of this series) some generalized reaction or recovery curves were presented. We shall now consider these in a more concrete manner, using the example of a reboiler and fractionating column (No. 9 and 10). Here the variable being measured and controlled is the temperature of the vapor at some suitable point in the column. A change in this temperature is sensed by the primary measuring element and the signal or impulse representing that change goes to a controller where it is converted to an output-air pressure that changes the opening of a valve on the steam line to the reboiler.

If steam pressure falls suddenly and less steam enters the reboiler, a lower vapor temperature results. A proportional controller will act to open the control valve gradually at a rate proportional to the deviation of vapor temperature from the desired value or set point. When values of the controlled variable (vapor temperature) are plotted against time, the recovery curve obtained shows an initial large maximum deviation from the set point followed by gradually decreasing fluctuations of temperature about a new control point. The temperature finally stabilizes at a new value different from the desired value (offset). The process reaction rate is "the maximum rate of change of the controlled variable caused by a specified sudden change in value of the manipulated variable." As such it refers to the first portion of the recovery curve. The slope of the reaction curve is indicative of the magnitude of the dead time in the system.

With a proportional-plus reset controller, under the same conditions of load change, floating action is superimposed. The control valve opening continues to be changed until the vapor temperature comes back to the initial set point.

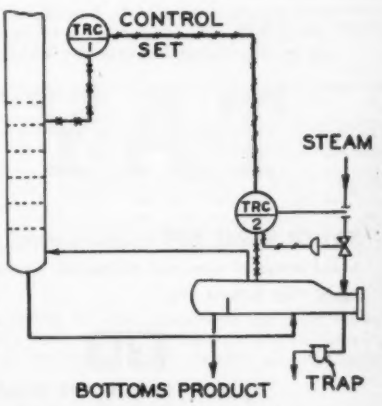
A third function, that of derivative response, may be incorporated in the controller (also known as rate, preact or anticipatory action). Rate action is defined as "that in which there is a continuous linear relation between rate of change (first derivative) of the controlled variable and position of the final control element." Addition of rate action "improves the recovery curve"—closer control is obtained where there is dead time or sudden load changes. The derivative function corrects for lag by making immediate change in valve opening before the deviation from the set point becomes as great as it would be if rate action were not employed. (With large dead-time rate response may not limit the maximum deviation very much but does provide a more rapid return to the control point).

As noted by Pellettere, when conditions are such that the need of a three-function instrument is indicated, interconnected control may be used. An instrument with the derivative function may not be available or its adjustment under process conditions might be difficult. For the reboiler-column system, with large heat transfer and distance-velocity lags, interconnected instrumentation is often specified. A temperature controller is used to reset a flow controller operating the control valve in the steam line to reboiler. In the words of Pellettere: "The secondary control instrument may be said to apply a coarse correction to the valve in an anticipatory manner. The pen of the main instrument eventually deviates some small amount in order to make the vernier correction. This minimizes or reduces the effect of any large load change to a small value."

A novel interconnected system, described by Breedlove[1] and indicated by Fig. 1, employs a temperature controller with primary element on the fifth tray from bottom to reset a second temperature controller with sensing element in the reboiler. This system was set up for a depropanizer designed to produce an overhead with low butane content. The instrument TRC-2 is a derivative controller.

References

1. Breedlove, H. B., "Depropanizer Instrumentation," The Oil and Gas Journal, August 25, 1949, p. 132.
2. Pellettere, J. A., "Use of Interconnected Control," paper presented before meeting of Instrument Society of America, 1948.



No. 31 in current series. The Refiner's Notebook has been published continuously since 1944

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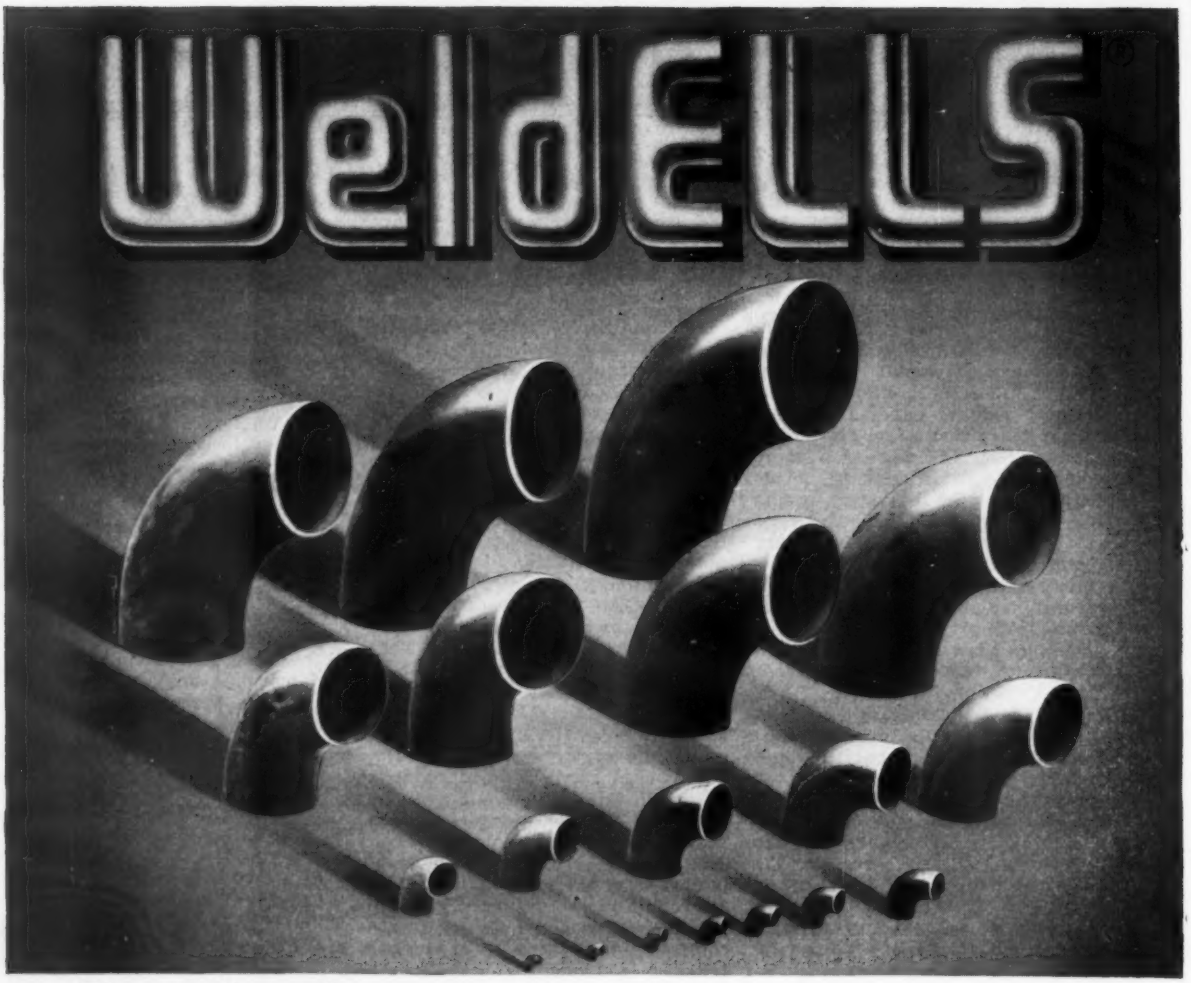

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2 HYDRAULIC CELLAR CONTROL GATE describes in great detail the design, operation, installation, and maintenance of a new cellar control gate. Large cutaway and annotated photographs illustrate every feature. Complete dimensional and engineering data tables are included. *Shaffer Tool Works.*

3 DATA SHEET V-450. Idlers on V-belt drives in a number of actual installations are diagramed and explained. *Ashcraft Idler Co.*

4 ELECTRONIC TIMER. Bulletin PC 478 describes series 30 which is recommended for process control and machine timing when long life, repeat-cycle operation, or precise accuracy is desired. The timer is recommended to control such automatic equipment as drilling machines, automatic filling machines, photographic printers, spot welders, grinders, and honing machines. *Photoswitch Incorporated.*

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basic government regulations of interest to all oil men. It includes chapters on leases and reservations, conservation and proration, immigration, minimum wages and holidays, business operations, taxation, tariffs and customs regulations, foreign exchange control board, Western Canada Petroleum Association, and maps of Saskatchewan and Alberta. *Royal Bank of Canada.*

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by Dan B. Miller

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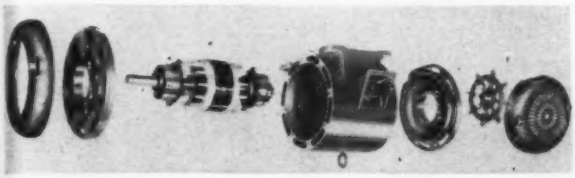

applications in chemical plants, oil field, refineries, and similar industrial plants where corrosion is a problem. A one piece, easily removable blower shield with integrally formed air intake protects the external blower. A cast-iron shield on the drive end is designed to deflect the emerging air stream around the bearing. Blowers used on standard motors are of malleable iron, and those used on explosion-proof motors are of nonsparking bronze. *Wagner Electric Corp.*

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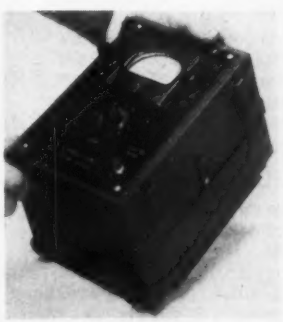
27 VIBROGROUND MODEL NO. 263 is designed to provide corrosion and electrical engineers with a light, rugged, accurate instrument of measuring soil, anode, and circuit resistances, and polarization effects. Weight is 9½ lb., ready to operate, with cover removed, or 10½ lb. with cover in place. Resistance ranges are 0 to 1, 0 to 10, 0 to 100, and 0 to 1,000 ohms. Power is provided by eight standard flashlight batteries, with a circuit incorporating a synchronous, selfrectifying vibrator having an output



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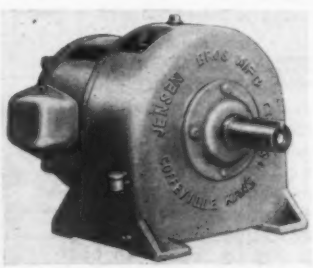
of 125 volts. It is capable of measuring the true resistance to earth of man-made grounds, irrespective of the earth resistance and conditions. Readings are not affected by resistance of auxiliary prods or leads, or stray a.c. or d.c. currents in the earth. *Associated Research, Inc.*

IT'S NEW CHECK IT

28 DAYLIGHT FLUORESCENCE COMPARATOR. Analysis of chemical, mineral, or other samples under ultraviolet light can be accomplished in broad daylight with the new instrument. Complete unit weighs less than 2 lb., making it ideal for use in the field or plant. Producing 90-per cent ultraviolet radiation at 2,537 Angstrom units, the instrument operates from two easily replaceable standard-size flashlight dry cells. Battery life is over 3 hours of continuous radiation. The housing has six detachable bases upon which the samples are mounted. *Menlo Research Laboratory.*

IT'S NEW CHECK IT

29 GEARTORK PLANETARY GEAR-SPEED REDUCER. The unit consists of a system of planetary gears mounted in a heavy-duty frame. Electric motor is bolted directly to this frame. Speed reducer and motor make a compact, easily mounted unit that requires only slightly more space than the motor itself for installation. It is available in a variety of sizes from ½ to 10 hp. Same sizes are available with double-reduction gear trains. Flanged-mounted models have been developed for special applications. Frame is cast semisteel. Gears are machined and shaved. Oil bath lubrication is used. Main shaft is mounted on antifriction bearings. It is especially adapted as replacement power for internal-combustion engines on oil-field pumping units. *Jensen Brothers Manufacturing Co.*

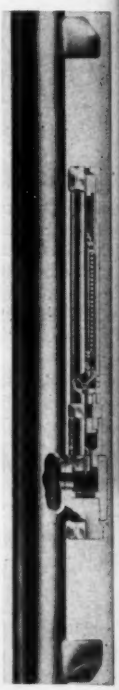


IT'S NEW CHECK IT

30 SAFWAY BOSUN'S CHAIR. Painting, repairs, and inspection of elevated work are facilitated by the new foot-operated bosun's chair. This convenient, one-man platform hoist consists of a rigid tubular-steel cage which is moved by means of an efficient winch. The worker operates standard bicycle pedals to raise or lower the hoist. Power is transmitted from the pedal crank to winch drum by means of a roller chain, running on sprocket wheels which are arranged in a ratio that permits operation with minimum effort. Movement of the hoist in either direction may be as fast as 25 ft. per minute. It has a rated capacity of 625 lb. and is furnished complete with 150 ft. of ¼-in., plow-steel, wire rope. Weighing only 75 lb., this unit can be handled by one man, and is rigged quickly for work in any location. *Safway Steel Products.*

IT'S NEW CHECK IT

31 NEW MERLA-TYPE "L" VALVE is designed to provide efficient gas-lift production in continuous-flow operations. Construction consists of a three-ply, seamless Monel bellows, compression spring, valve stem, valve, and valve seat and choke. Fluid-filled bellows provides protection against bellows damage due to excessive hydrostatic pressures. A scientifically designed compression spring assures a constant-operating pressure under extreme temperatures. A choke below the valve seat governs the required gas passage of the valve. Opening pressure of the valve is a direct-line function of the amount of back pressure against the valve. This feature gives positive assurance that the upper valves in a gas lift string, will not open while the lower valves are in operation. *Merla Tool Corp.*



IT'S NEW CHECK IT

32 NEW GROUND CLAMP. A new lightweight, low-cost ground clamp of 300-amp. capacity is designed to provide a convenient, readily movable, yet solid ground connection for welding jobs where welding currents do not average over 300 amp. The clamp not only cuts accessory costs for these jobs but also eliminates for welders the inconvenience of handling heavy-duty clamps on jobs where their extra capacity is not needed. Jaws are made of a special steel and copper alloy which is both highly conductive and highly resistant to wear. *Lincoln Electric Co.*

IT'S NEW CHECK IT

33 SERIES 650 DIESEL HIGHWAY TRACTOR is designed to haul loads of 55,000-lb. gross combination weights. Rear-axle-capacity rating is 19,000 lb. Because of the weight saving due to the two-cycle engine design, extremely low power-weight ratios have been achieved. Engine, which has a compression ratio of 16 to 1, contributes materially to low fuel consumption. With 283.7-

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JELFLAKE... the standard of the oil fields... is your best insurance against mud losses

Many experienced drilling operators find that conditioning mud with Jelflake is good insurance against mud losses. This tough, thin, fragmented plastic foil filters out on formation walls—seals off "thief" formations.

Jelflake is first choice for preventing or regaining lost circulation in many fields. It is quickly and easily used, holds its strength, will not ferment. Jelflake's crinkled surface prevents it from balling, and its low specific gravity allows it to remain in suspension in drilling mud for an indefinite time. Jelflake pumps easily through pump valves and circulating equipment, and its properties are not adversely affected by water, oil, mud chemicals, bacterial action or high bottom hole temperatures and pressures.

Jelflake is also used to prevent loss of cement slurry during cementing operations. Ask your nearest mud distributor, supply store or Dowell station for Jelflake, packaged in strong, wet-proof 25-pound bags.

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FOR OIL INDUSTRY CHEMICAL SERVICE

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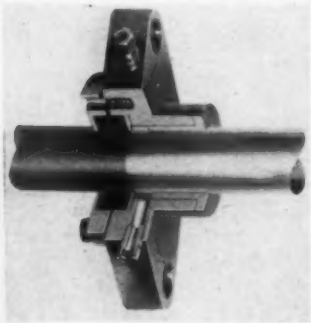
cu. in. piston displacement, the engine develops 133 hp. at 2,000 r.p.m. governed speed and 400 ft-lb. of gross torque at 1,200 to 1,300 r.p.m. Radiator and cab are mounted with a flexible suspension. Air brakes are of heavy, cast, two-shoe construction. *GMC Truck & Coach Division, General Motors Corp.*

IT'S NEW CHECK IT

34 STUFFING-BOX GLAND designed to replace standard rod oilers of the usual injected-grease and gravity-flow liquid types, provides a pressure-lubricating system that gives positive seal at the liquid end of the pump. It is a positive-circulating, oil-bath system adaptable to all high or low-pressure mechanical pumps. A constant bath of undiluted lubricating oil around the rods eliminates most of the friction by lubricating the packing. Gland is supplied with a circulating system that pumps approximately ½ gal. of oil per minute. Oil is returned to reservoir, cleaned and recirculated. Mounting hole centers are same as original equipment on your pump. Greatly reduces shutdowns for repacking. *Western Iron & Foundry Co.*



IT'S NEW CHECK IT

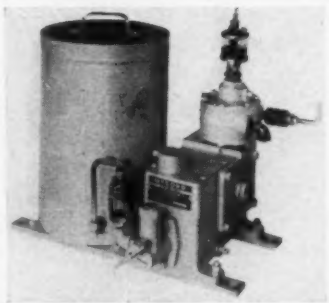
35 METAL SAFETY HAT. High-impact resistance is built into this new 12-oz. aircraft-grade aluminum-alloy safety hat. Distinctive ribbed design furnishes ample structural strength while the crown remains resilient to absorb much of the impact of a falling object. Inner hat assembly is designed to absorb shock with its full-floating, six-point suspension hammock. Headbands and hammocks are fully adjustable to fit all head shapes and sizes. Entire assembly can be replaced without tools with slide-action, wedge-type fasteners. *E. D. Bullard Co.*

IT'S NEW CHECK IT

36 ZIPCOAT for couplings is designed to cover and protect a Dresser-coupled joint. Each has a bleeder valve to vent air during backfilling. Zipcoat for welded joints is for the protection of circumferentially welded joint. Zipcoat for insulating joints is similar to that for welded joints, but comes in 10-ft. lengths. It eliminates costly boxing and permits immediate trench backfilling. They are easy to install, the time required for installation being only 1/10 of the time it takes to coat a joint. At the same time they eliminate definite hazards such as working with flames, handling hot coating compounds, and danger from fumes or burns. *Dresser Manufacturing Division.*

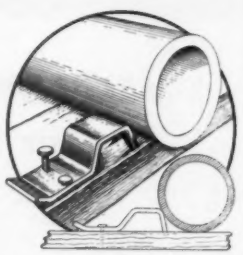
IT'S NEW CHECK IT

37 GAS-DRIVEN, ROTARY-MOTOR-OPERATED CHEMICAL PUMP. In this new gas-driven rotary pump there are no piston rings, rockers, counterweights, or reciprocating parts to wear. A rotor and four sliding valves are the only moving parts in the motor. This results in a compact and totally enclosed unit. Rotor vanes take up their own wear, resulting in almost service-free operation. Motor shaft is fitted with thrust bearings, and the entire unit is manufactured to close tolerances. This gas-driven, rotary motor may be applied to any McCord Class "C" chemical pump in service. *McCord Corp.*



IT'S NEW CHECK IT

38 LEDO PIPE STOP. This pipe stop is intended to be nailed to the wood runner under a layer of pipe, to hold the outside joints from rolling. It is designed so that the more pressure applied against it, the deeper the teeth sink into the wood runner and the stronger it becomes. A lip on the back side makes it easy to remove with a hammer or pinch bar. Of sturdy steel construction, it can be used over and over without bending or loosing its effectiveness. *Ledo Manufacturing Co.*



IT'S NEW CHECK IT

39 TENSION-PULL LOADBINDER. Each operation of the handle takes up slack and tightens until desired tension is reached. Compound leverage action enables one man to exert up to 4,500 lb. of tension pull on the chain without the use of an extension pipe, chain falls, or similar equipment. The continuous-action feature makes it a versatile tool in general oil-field-material handling and in rigging. It is made in six sizes from 3,000 lb. capacity for light commercial use, up to 30,000 lb. capacity. *Canton Cast Products.*

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Pipe line with a future

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BITUMASTIC ENAMELS

Steel pipe lines, carrying gas and oil underground, need long-lasting protection against corrosion. And Koppers Bitumastic® Enamels provide that protection.

Koppers Bitumastic Enamels have been *proved by performance.* Under the most severe corrosive conditions . . . in all types of soil . . . under wide variations of temperature—these protective coatings have been giving good service for 30 to 40 years. And the knowledge gained by Koppers in protecting thousands of miles of pipe lines can be of value to *your* next pipe-line job.

There are good, sound reasons for Bitumastic's lasting protection. Processed from a base of coal-tar pitch, Koppers Bitumastic Enamels are impervious to moisture. They are chemically resistant to soil elements; they do not disintegrate with age; they maintain continuously high electrical resistance. Get in touch with your Koppers representative for details.

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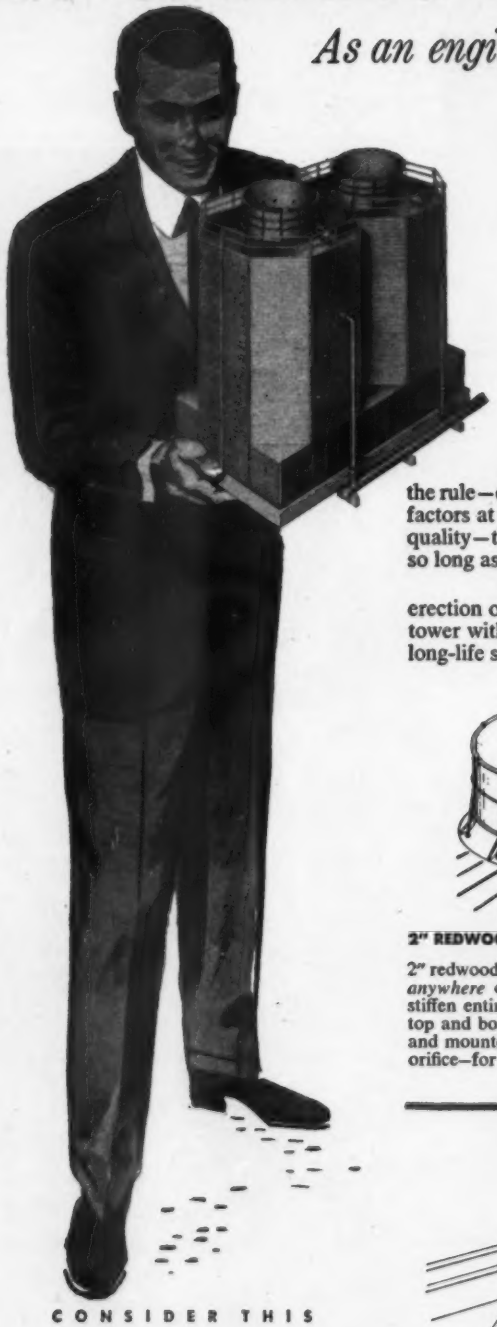
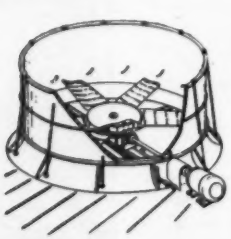
As an engineer you will appreciate...

The RUGGED DESIGN inherent in the 1950 FLUOR COUNTERFLO Cooling Tower



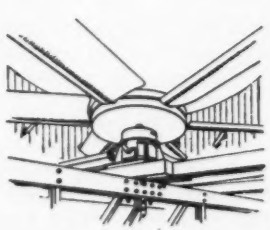
Ruggedness is a prerequisite in cooling tower design and performance. Without it, inefficiency and costly maintenance becomes the rule—drop in plant production is the end result. Regardless of the influencing factors at time of purchase—low first cost, claims of efficiency or statement of quality—the cooling tower you select will meet performance requirements *only* so long as its original structural design endures.

Thirty years' intensive development in the design, fabrication and erection of cooling towers enables Fluor to offer you a better cooling tower—a tower with comparable first cost, the highest obtainable efficiency and rugged, long-life service.



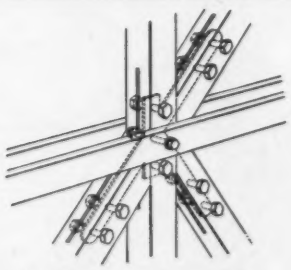
2" REDWOOD IN FAN DECK and STACK

2" redwood supports 1000#/sq. ft. load *anywhere* on deck—heavy enough to stiffen entire structure. Stack is ringed top and bottom with heavy angle iron and mounted on a metal bell-mouthed orifice—for safety and savings in power.



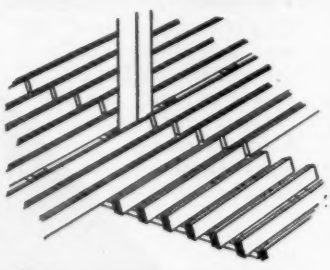
RUGGED GEAR UNIT and FAN BLADES

Gear unit is designed *specifically* for cooling tower service. Result: Less than ¼ of 1% replacement parts!
Heavy Stainless Steel Fan Blades give a larger moment of inertia—tips are strong enough to hold a man's weight.



STRONGER STRUCTURAL DESIGN

Internal gusset plate and bolt-type joints enable structural members to take *both* tension and compression loads—a design *in accordance* with the rigid requirements of major city codes and recent findings of the U. S. Forest Products Laboratory.



1" REDWOOD GRID DECK FILLING

Grid decks consist of heavy 1" redwood nailed individually on sturdy cleats—strong enough for use as scaffolding during tower erection, durable enough to permit repeated removal for cleaning or fire hosing without removing from tower.

CONSIDER THIS *about*

"Guaranteed Performance"

Fluor's "Guarantee of Performance" is based on a true bid to meet specified performance requirements. There is an old saying, "You can't get something for nothing." This is particularly true in the purchase of cooling towers—a bid allowing performance to be off only 2 or 3 degrees on the approach may seem insignificant at time of purchase, but it can mean as much as 30 to 40% difference in the size of tower necessary to do the specified job! Often this is overlooked if a tower is purchased on price alone.

For your protection compare the probable performance of the towers offered before making a decision. Analyze your cooling tower bids thoroughly!

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REFINING

Cracking Unit for Socony

Socony-Vacuum Oil Co., Inc., has let contract for a new thermofor catalytic cracking unit to be installed in its East Chicago, Ind., refinery. This brings to eight the number of units now under construction, or to be completed during 1950. The construction contract has been let to C. F. Braun & Co.

The new TCC units with moving-bed catalysts replace Houdry fixed-bed units, providing an increase of 50 per cent over the present 10,000-bbl. unit capacity daily. The expansion will give a daily throughput of 120,000 bbl. of high-quality automotive and aviation gasoline and other products.

Similar conversion is being made at company refineries in Buffalo; Beaumont, Tex.; Booklyn; Trenton, Mich., and Augusta, Kans.

Two more TCC units of simplified design have been licensed by Socony-Vacuum to be installed by Standard Oil Co. (Ohio) in its Cleveland refinery.

Truce Called in Strike

PORT ARTHUR, Tex.—A 60-day truce has been called by The Texas Co. and Local 23, Oil Workers International Union (C.I.O.), in a strike of workers at the plant unit of company's Port Arthur works and terminal.

Negotiations are now under way between Texaco and the union for a new labor contract. Under terms of the truce the union was directed to declare the strike off on July 29, and the company was to schedule for return to work all employes in the plant unit, and to resume normal operations at the earliest practicable date.

Wages, hours, and working conditions in effect in the plant unit at the time the strike began April 4, shall be in effect until the new labor contract is executed, or until terminated by 60 days' prior written notice by the company and the union, whichever occurs sooner, the agreement read.

The union and company are to withdraw "with prejudice" the charges on file with National Labor Relations Board regarding the case.

Refining-Company Dividends

WASHINGTON.—Publicly reported cash-dividend payments of oil-refining corporations in May amounted to $11,500,000 compared with $10,000,000 in the same month last year, it was reported last week by the Department of Commerce.

For the 3 months ended with May, the department said, oil-refining corporations paid $156,300,000 in dividends against $110,600,000 in the same 1949 period. In the 1950 period, refiner dividends accounted for more than 10 per cent of the $1,512,200,000 paid out by all corporations.

Coal-Tar-Products Output

Production of coal-tar products fell off 10.6 per cent in 1949, the Tariff Commission reported last week. Total volume for the year amounted to 915,000,000 gal., the preliminary report

NELSON REFINERY-CONSTRUCTION INDEX

Appears in the first issue of each month.
Explanation—Cost-imating No. 61, December 15, 1949, pages 91, 92.
Compiled by W. L. Nelson—Refinery Consultant—Tulsa.
Indexes of Individual Equipment Items—January, April, July, October.

INDEX (1946 = 100)

	1947	1948	1949	April 1950
Centrifugal pumps	109.0	120.0	118.9	123.7
Reciprocating pumps	128.5	138.1	144.6	139.6
Compressor	114.0	128.0	120.0	117.0
Engines	109.0	120.0	115.6	113.2
Motors	110.0	112.7	114.0	129.0
Transformers	116.0	116.0	116.0	98.7
Instruments	113.0	120.0	122.0	123.1
Miscellaneous equipment average	114.2	122.1	121.6	120.6
Materials component	122.4	139.3	143.6	145.3
Labor component	113.5	128.0	137.1	141.0
Refinery construction index	117.0	132.5	139.7	142.7

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said, and included tars from coal, water-gas, and oil-gas operations.

The report reflected the growing share of petrochemicals in the field of basic products. Toluene production last year amounted to 82,000,000 gal. of which 59 per cent came from petroleum sources. This preliminary total reflects a slight decline from the 83,000,000-gal. output of 1948.

Benzene, currently in short supply, began its decline in production a year ago. Petroleum-derived benzene output began early this year and while it still contributes but a small percentage of the total production, its future in the field is considered firm. The 1949 production of benzene, not including motor benzene, was 133,000,000 gal. as compared with 174,000,000 gal. in 1948. Motor benzene showed some increase: 23,000,000 gal. in 1949 and 12,900,000 gal. in 1948.

Xylene, obtained chiefly from petroleum sources, was off slightly last year. The 1949 production amounted to 58,000,000 gal. as compared with 61,000,000 gal. the previous year. Road tar from coal increased slightly, from 130,000,000 gal. in 1948 to 141,000,000 gal. last year.

Tax Receipts Up Slightly

WASHINGTON.—Receipts from the three federal taxes on oil for the fiscal year ended last June 30 were a scant $18,500,000 above those of the preceding year, it was reported last week by the Treasury Department.

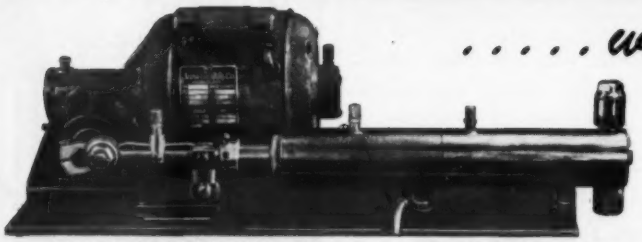
What increase there was was due to a $23,085,000 boost in gasoline-tax collections, revenue from the levy on lubricating oils dropping $4,150,000 and from pipe-line transportation, $405,500. Gasoline was one of only 29 categories of tax which showed an increase for the year; the other two oil taxes were among the 47 which showed decreases that were responsible for a $1,506,000,000 drop in total tax collections as compared with the fiscal year 1949.

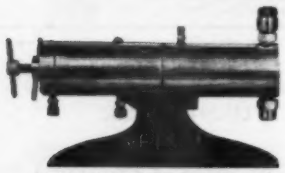
The department announced that gasoline-tax revenue for the fiscal year hit an all time high at $526,732,000 against $503,647,000 for the preceding year, while lubricating-oil receipts dropped to $77,610,000 from $81,760,000 and pipe-line-transportation collections declined to $18,919,000 from $19,325,000.

Collections for the month of June included $46,430,000 from gasoline against $48,155,000 last year; $10,992,000 from lubricating oils against $10,523,000; and $1,458,000 from pipe-line transportation against $1,831,000, the report showed.

The Government's total tax revenue for the year was $38,957,132,000 compared with $40,463,125,000 for the fiscal year 1949, with individual and corporation tax collections showing a decline of $1,597,832,000 which was only slightly offset by slight gains in other categories.

NELSON CHEMICAL PROPORTIONING PUMPS
..... with these Features
- Wide Volume and Pressure Range
- Safety in Hazardous Locations
- Air-tight, Oil-sealed Packing
- Easy Accessibility of Valve Assemblies


NELSON MOTORIZED DRIVE PUMP


NELSON SYNCHRONIZED DRIVE PUMP

NELSON SELF-PROPELLED PUMP

For accurate chemical proportioning in the petroleum industry you'll find the efficient answer in a Nelson pump. If a standard Nelson pump doesn't meet your requirements we'll solve your problem with a special job-designed unit. For gasoline gum inhibiting, acid and sludge prevention, treating of emulsions—and for other applications where proportioning or sampling of liquid or chemical solutions is desirable—Nelson chemical proportioning pumps are ideally suited. They were pioneered in the oil fields and refineries of Wyoming. *Write for descriptive folder.*

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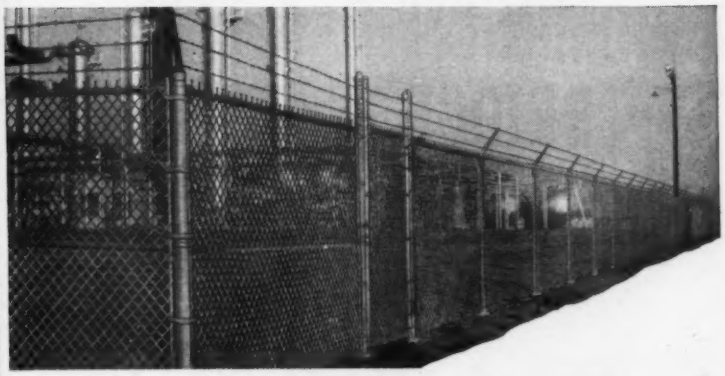

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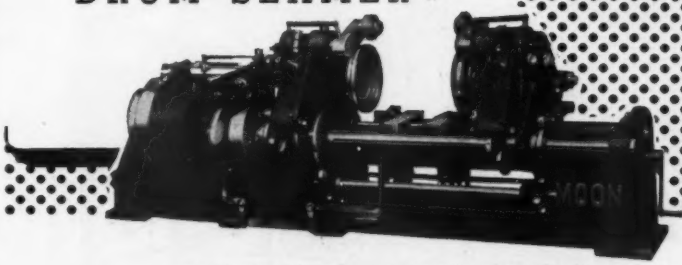

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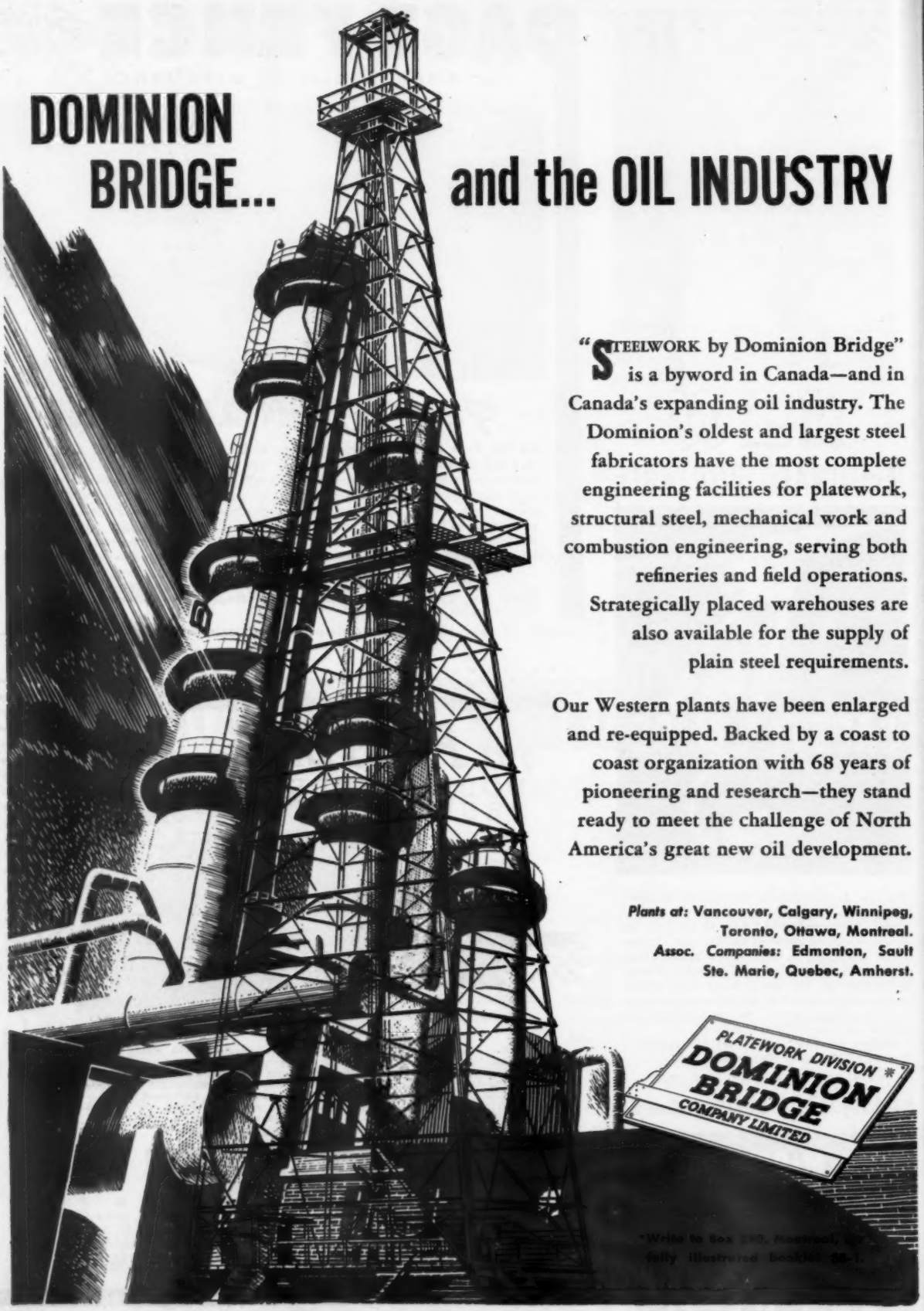

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PIPE LINES

Contracts Let

Texas Illinois lets work for 1,331 miles of line

CHICAGO.—Texas Illinois Natural Gas Pipeline Co. has let major construction contracts for the 1,331-mile natural-gas line which it will build from the lower Texas Gulf Coast area to the Chicago metropolitan vicinity.

Four major construction companies will build the system, Joseph J. Hedrick, president of the pipe-line company and of Natural Gas Pipeline Co. of America, said. They are: Midwestern Constructors, Inc., Tulsa; H. C. Price Co., Bartlesville, Okla.; Bechtel Corp., San Francisco; and Fish Pipeline Construction Corp., Houston.

Midwestern, Price, and Bechtel will construct the line, most of which will be 30-in. pipe, and Fish will build the system's compressor stations. The entire project, Hedrick said, is being directed by management of Texas Illinois, of which Mark V. Burlingame is vice president of operations.

The Federal Power Commission granted authorization for the $120,000,000 line in June. Initial daily capacity will be 305,000,000 cu. ft. *(The Oil and Gas Journal, June 29, 1950, page 39.)*

The third line to supply the Chicago area, this new artery will augment the natural-gas supply now being furnished by Natural Gas Pipeline Co. of America's dual lines, to utilities in Illinois, Indiana, Iowa, Kansas, and Nebraska.

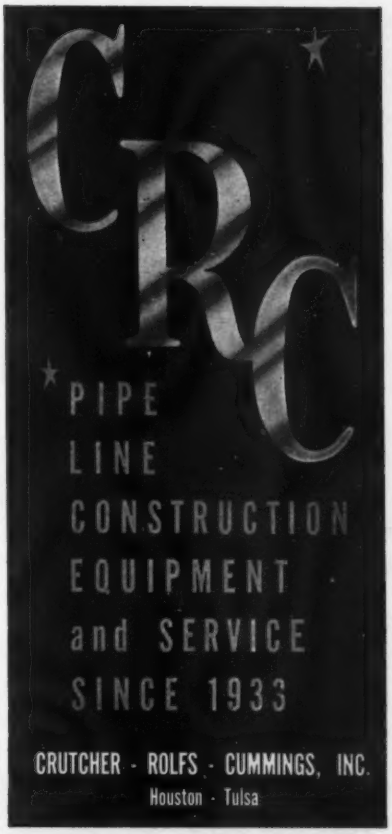
Work under way.—Already 300 miles of right-of-way have been purchased, Hedrick said, and practically all surveying work is complete and design of the pipe line itself has been finished. Plans are virtually complete for all compressor stations, he continued.

Construction, under terms of the FPC certificate, was to begin by August 15 and must be completed by the end of 1951.

Midwestern Constructors will lay the portion in Illinois, consisting of 292 miles of 30-in. from Cape Girardeau, Mo., to the line's two terminal points at Joliet and Volo. In addition, the firm will build a 100-mile section of 26-in. line in the coastal plain area of Texas.

H. C. Price will build 38 miles of 12-in., 36 miles of 24-in., 97 miles of 26-in., and 113 miles of 30-in. line, all in the coastal plain region; and 126

***WRAPPING PIPE.**—Pipe-wrapping operation is shown on Salt Lake Pipe Line Co.'s products line between Salt Lake City and Pasco, Wash. The line, being built by Salt Lake, a subsidiary of Standard Oil Co. of California, will carry major products of Salt Lake Refining Co., another Socal subsidiary, to bulk plants in Utah, Idaho, Oregon, and Washington. Pipe is covered with a hot solution of dope, wrapped with layers of glass fiber, and finally with a heavy asphalt paper covering, to prevent corrosion.*



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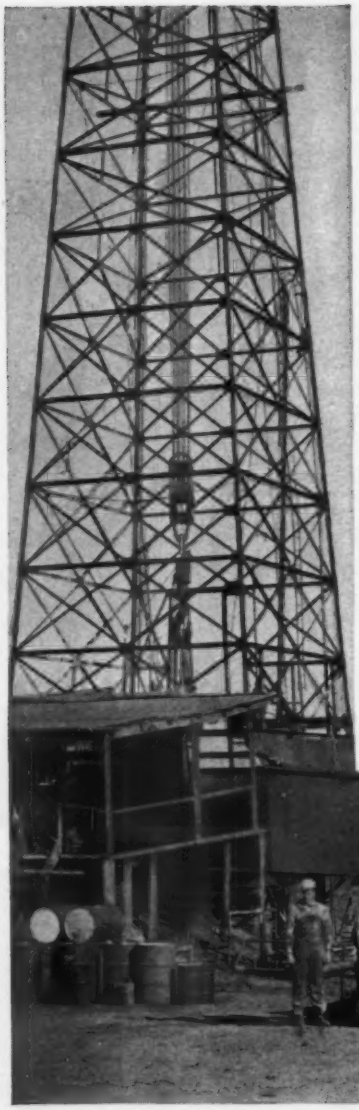

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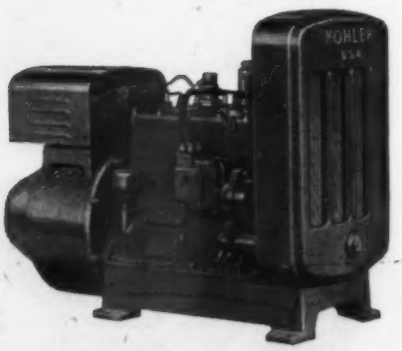

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miles of 30-in. main transmission line through eastern Texas north of Houston.

Bechtel Corp.'s contract calls for 420 miles of 30-in. line in Arkansas and Missouri.

Four multiple-line submerged river crossings will be built. They will include: the Trinity River in Texas; the Arkansas River near Little Rock; the White River in Arkansas; and the Illinois River, near Joliet. The crossings will be double lines of 24-in. pipe having 1-in. wall thickness. Price will build the Trinity crossing; Bechtel is to build the Arkansas and White River crossings; and Midwestern will handle construction of the Illinois crossing.

Aerial crossings planned.—Four rivers will be spanned by aerial crossings, using suspension bridges designed by Mathers & Kenan, San Antonio. They are the Colorado, and Brazos in Texas; the Red in Arkansas; and the Mississippi, near Cape Girardeau, Mo. Proposals will be sent out to bidders for construction of these bridges August 15, Hedrick said.

Work will get under way in the fall on the compressor stations by Fish Pipeline Construction. Three have been approved by FPC, with horsepower ratings of 2,000 each. Two additional stations are contemplated by Texas Illinois to handle additional supplies of gas as they are contracted for.

The approved stations will be supplied by Worthington Pump & Machinery Corp., with two 600-hp. Cooper-Bessemer auxiliary units in each station.

A. O. Smith Corp. of Texas will fabricate the entire 1,021 miles of 30-in. in the firm's Houston plant. The 20, 24, and 26-in. pipe will be supplied from Smith's Milwaukee plant.

Financing plans completed.—The company also announced that it has completed the $120,000,000 financing program in connection with the project. Final details were concluded when signed agreements with 16 insurance companies for purchase of $90,000,000 in first-mortgage pipe-line bonds were delivered to Texas Illinois, and payment was made to the company by the purchasers of $12,000,000 of interim notes issued by Texas Illinois. Subscription period for $17,500,000 of Texas Illinois common stock expired on July 24, and all of the stock offered was purchased by stockholders.

New Company Formed

CLEVELAND. — A new company, Essaness Corp., jointly owned by Standard Oil Co. (Ohio) and Shell Oil Co., has been formed to expand the petroleum - products pipe-line-transportation facilities of the two companies.

The new firm will begin work the middle of this month on 57 miles of additional 8-in. line between Lima and

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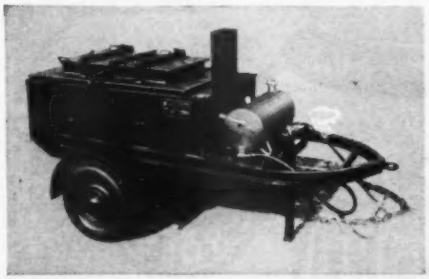

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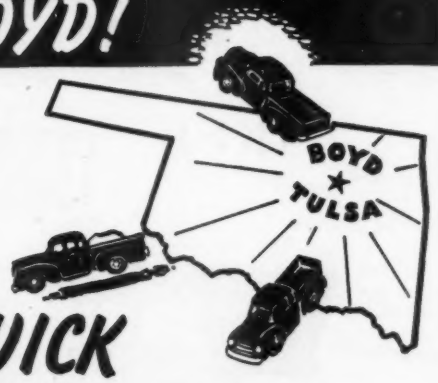

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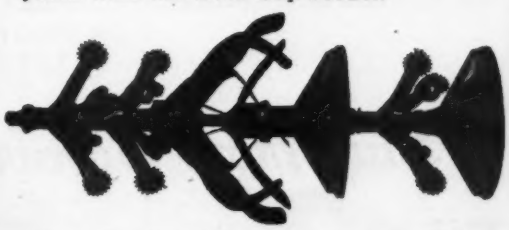

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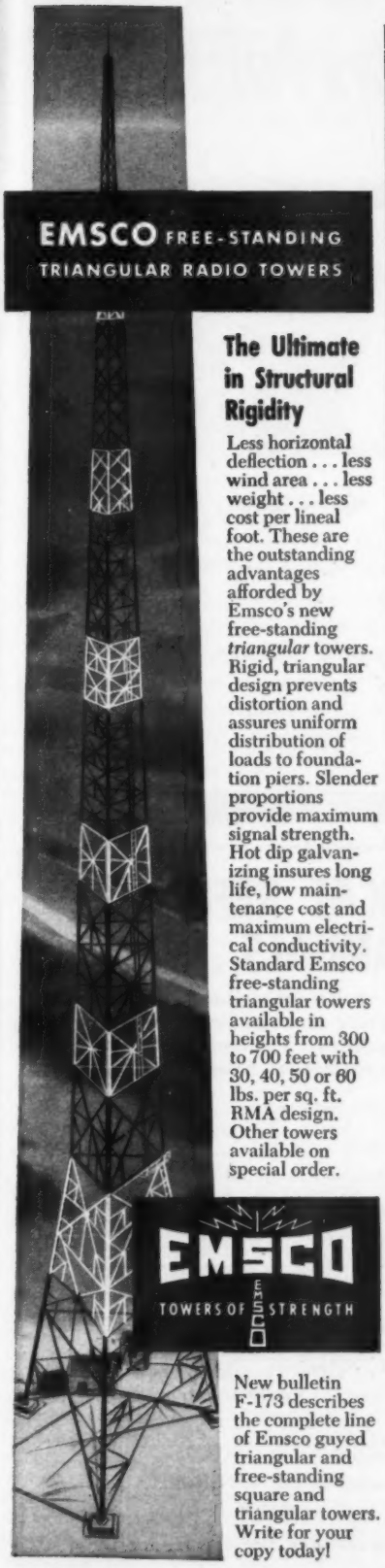

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Springfield, which will cost an estimated $1,300,000.

Essaness will also acquire Sohio's existing 6 and 8-in. products lines between Toledo and Lima, as well as Sohio's 6-in. line between Dayton and Springfield, and Shell's 6-in. lines between Springfield and Columbus.

Essaness' lines will be operated and maintained by Sohio and Shell personnel, since all pumping stations on these lines will remain in the hands of the sponsoring companies. Essaness will be managed jointly and equally by Sohio and Shell.

The Miami Valley Corp., owned jointly by Sohio and Pure Oil Co., was formed recently and plans to construct a new 57-mile 8-in. products line between Dayton and Cincinnati, at an estimated cost of $1,400,000.

Mid-Valley Progresses

Mid-Valley Pipe Line Co. (Sun and Sohio) reported recently that 75 per cent of the pipe laying on the project has been completed, all pipe has been rolled, and the remainder is now being delivered. When completed, the 22-in. crude line will run from Longview, Tex., to Lima, Ohio.

A 120-mile section from Cincinnati to Lima, Ohio, was completed in June and was placed in operation in July. All tanks have been constructed, and pumping stations and buildings are nearing completion. The entire project is expected to be placed in operation in October *(The Oil and Gas Journal, July 20, 1950, page 52)*.

The 120-mile section from Haynesville, La., to Mayersville, Miss., is in operation, carrying crude from producing fields to fill the eight 81,000-bbl. tanks at Mayersville, and to provide crude for shipment by Sohio tow boats up the Mississippi and Ohio rivers to Mount Vernon, Ind., and Bromley, Ky.

River Crossings O.K.'d

WASHINGTON. — Temporary authorization has been granted by the Federal Power Commission to Texas Gas Transmission Corp., Owensboro, Ky., for construction of two 3.4-mile 20-in. submarine pipe lines across the Mississippi River in the Greenville, Miss., area.

The authorization also includes construction of 1.93 miles of 26-in. pipe line to interconnect the submarine lines with Texas Gas' 18-in. and 26-in. pipe-line systems. Estimated cost of the construction is $1,457,595.

Texas Gas said the new lines are required because of the failure during the early spring of 1950 of four of its submarine pipe line crossings under the Mississippi in the Greenville area. The failure, the company said, has caused an excessive pressure drop at the river crossing which has resulted in a serious decrease in capacity of its two systems.

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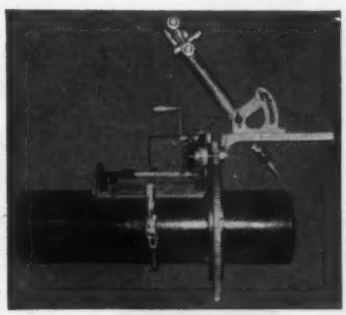

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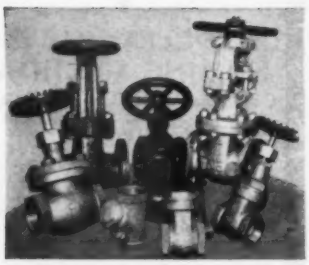

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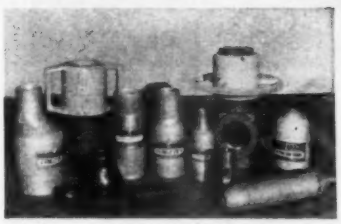

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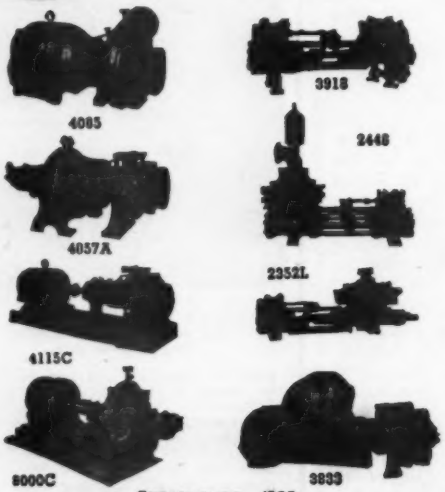

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THE OIL AND GAS JOURNAL
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NATURAL GAS

Program O.K.'d

Colorado Interstate and Canadian River to expand

WASHINGTON. — Colorado Interstate Gas Co. and Canadian River Gas Co. have been authorized by the Federal Power Commission to construct pipe-line facilities which will carry additional natural gas to the Rocky Mountain market area.

FPC has reopened, however, the record on the proposal of Colorado Interstate to acquire and operate Canadian's facilities upon conditions set forth in the joint application of the two companies.

The commission reopened the proceedings for hearing of testimony limited to the sole issue of the reasonableness of payments by Colorado to Southwestern Development Co., which controls Canadian. No hearing date was set.

The pipe-line facilities involved in the authorization include a 215-mile, 20-in. line extending from the West Panhandle (Texas) gas field to Colorado's Kit Carson, Colo., compressor station. Colorado said the line, which will deliver gas into its existing Lakin, Kans.-Denver line, is necessary in order to provide adequate natural gas for its resale customers in the Rocky Mountain market area.

In addition to the line, a 4,800-hp. compressor station will be built at the southern terminus, and a gasoline plant and dehydration plant will be constructed on the discharge side of the compressor station.

Estimated cost of the construction program is $10,160,200, plus an additional investment of approximately $3,697,400 in production and gathering facilities.

Colorado has proposed to acquire Canadian River's facilities in order to secure an adequate financing base for the proposed construction program. As consideration, Southwestern was to receive all the natural gasoline contained in the natural gas now owned by Canadian River in the West Panhandle field and pay over to Colorado one-half of the gross receipts from the sale of the gasoline derived from the natural gas going to the Rocky Mountain area. Colorado on the other hand was to bear all costs of production, gathering, processing and royalty payments. Furthermore, Southwestern was to receive 85 per cent of net revenue from gasoline associated with natural gas delivered to Natural Gas Pipeline Co. of America and destined primarily for the Chicago market.

In reopening the record for the purpose of determining the reasonableness of these payments, estimated at $800,000 to $1,000,000 a year, FPC said that Southwestern may have residual and other continuing rights in Canadian's properties which have not been shown on the record.

Phillips Motion Dismissed

WASHINGTON.—The Federal Power Commission last week dismissed a motion of Phillips Petroleum Co., Bartlesville, Okla., to limit the issues involved in the commission's investigation of the company's natural gas operations.

The company filed its motion July 6, asserting that it may be an independent producer within the meaning of FPC Order No. 139 which disclaimed jurisdiction over independent producers and gatherers of natural gas who might be subject to control solely because of arm's-length sales of gas, but the commission rescinded that order 5 days later and last week held that the motion raises questions which had become moot.

While the action of the commission was apparently unanimous, Commissioner Harrington Wimberly issued a statement explaining that he had concurred in it simply because the motion was grounded upon an order which no longer exists.

"I do not consider as moot," he said, "the merits of Order No. 139, nor do I agree with the apparent conclusions of the majority of the commission that all sales by producers or gathererers of natural gas in interstate commerce for resale, even though made at arm's-length in the producing field, impose on such sellers the status of natural-gas companies under the Natural Gas Act."

Bids Are Consolidated

WASHINGTON.—The Federal Power Commission has consolidated the application of Algonquin Gas Transmission Co., Boston, for hearing with the application of Northeastern Gas Transmission Co., also of Boston, and others previously consolidated. Both Northeastern and Algonquin are proposing to construct natural-gas systems in the New England area.

The consolidated proceedings, involving Northeastern and four other companies—and now Algonquin—reconvened last week in Washington, D. C.

The commission denied the part of a motion of National Coal Association and others seeking to have two applications involving Texas Eastern Transmission Corp. consolidated with the hearing. One of the Texas Eastern applications proposes the construction of facilities which would be used, in part, to supply Algonquin with natural gas. The other Texas Eastern application involves the proposed development of natural-gas storage facilities in Pennsylvania. The latter application was filed jointly by Texas Eastern and New York State Natural Gas Corp.

In addition to the Algonquin and Northeastern applications, the consolidated proceeding includes proposals of Tennessee Gas Transmission Co. and Transcontinental Gas Pipe Line Corp., which would supply Northeastern's natural-gas requirements; and New York State Natural Gas Corp. and Niagara Mohawk Power Corp., which would build pipeline facilities in New York State. Tennessee would supply gas to New York State Natural for resale to Niagara Mohawk.

In a concurrent order, FPC denied a motion of Texas Eastern Transmission to consolidate its applications, proposing the construction of facilities to supply Algonquin, with the Algonquin application.

Meanwhile Natural Gas Co. (New York) and its subsidiaries, Peoples Natural Gas Co. and New York State Natural Gas Corp., both of Pittsburgh, filed an application with the Securities and Exchange Commission for authority to enter into an agreement with Texas Eastern for the sale by Peoples to New York State Natural Gas and Texas Eastern of certain oil and gas leases and other interests in land, together with gas wells, pipe line and other facilities in the Oakland Storage Area, Westmoreland County, Pennsylvania.

The application explained that the transfer is proposed to provide for the joint development and operation of a natural-gas storage pool by the Consolidated system and Texas Eastern, the latter to supply gas for the operation of the pool beyond the ability of the Consolidated stem to provide from its own available supplies.

The purchase price stated in the application is approximately $2,550,000, to be borne equally by the New York and Texas Eastern companies, which includes $2,000,000 to be used to carry on development work and acquisition of storage rights pending the transfer.

Proposes Acquisitions

WASHINGTON.—Indiana Gas & Water Co., Inc., Indianapolis, has filed an application with the Federal Power Commission proposing acquisition of properties of Eastern Indiana Gas Co., Summit Gas & Water Co., Inc., and Knightstown Natural Gas Co., Inc., all in Indiana.

The application asked FPC to disclaim jurisdiction over the proposed transaction or, in the alternative, to authorize the acquisition and operation of the facilities. The facilities consist of gas-utility systems serving various communities in Indiana.

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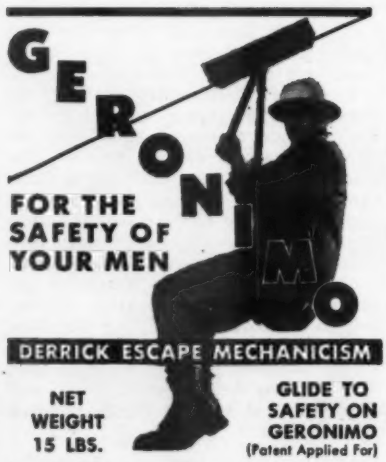

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Among the Drilling Contractors

Dallas Firm Contracts Two More Deep Tests

Standard-Fryer Drilling Co., Dallas, has taken on contracts for two additional deep wildcat tests in West Texas. One is for a 13,000-ft. test to be drilled for W. W. Cumberland of New York and Ted Weiner of Fort Worth in northeastern Midland County. Location is for 1 Lay Powell, and is in SW NW Section 4, Block 36-T2s, T. & P. Survey. The other is for an 8,500-ft. test to be drilled for H. H. Coffield and associates at 1 Shroeder, NW of Section 2, J. B. Cotton Survey, 2 miles east of Post, Garza County.

Camay Works Six Rigs

Camay Drilling Co., Los Angeles, has six rigs at work in various California areas. Three are drilling for Long Beach Oil Development Co. in the Long Beach harbor area. Two are drilling for Southern California Petroleum Co. in the northwest Cuyama area. The sixth is on a well recently started for Trigood Oil Co. in the Del Valley area, Los Angeles County.

Mack Oil Co., Duncan, Okla., has a rig running for T. H. McCasland in the Cruce area of Stephens County, Oklahoma. Now drilling is 4 Charleston, SW SE NW 32-1n-5w.

Adkins Drilling Co., Great Bend, Kans., is drilling for Skelly Oil Co. at a wildcat location 5 miles northeast of the Davis Ranch pool, Wabaunsee County, northeastern Kansas. Location is on the Thowe lease in 2-13-10e. This contractor drilled the discovery well in the Davis Ranch pool of Carter County and has been active in that pool since then.

Sunnyland Contracting Co. is the contractor on a wildcat test being started by Union Producing Co. northwest of the Sherron pool, southern Jasper County, Mississippi. The test is 1 Braddock Unit, in 20-10n-11w.

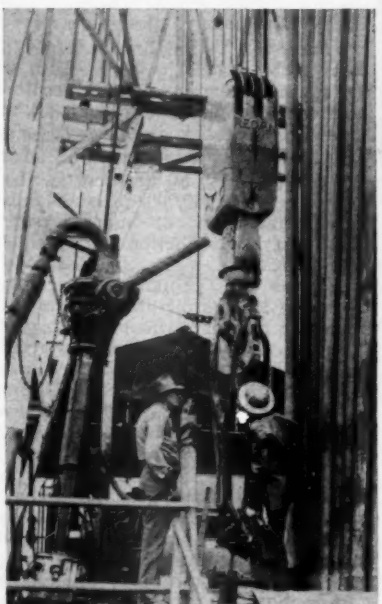
Stickle Drilling Co., Wichita, has the contract for The Texas Co. 1 Dryden, SW NW SW 9-17-14, a lately started well in the North Carroll area, northwestern Barton County, Kansas.

Brinkerhoof Drilling Co., Casper and Dallas, is moving a rig from Wyoming to Scurry County, Texas, where it has a contract to drill a wildcat test for W. C. McBride, Inc. It also is starting a wildcat for its own account in Howard County, West Texas, using a rig already in the area. The latter test, 1 Jones, Section 18, Block 34, Township 2, T&P Survey, is projected to 9,000 ft. The latter location is southwest of the Vealmoor pool.

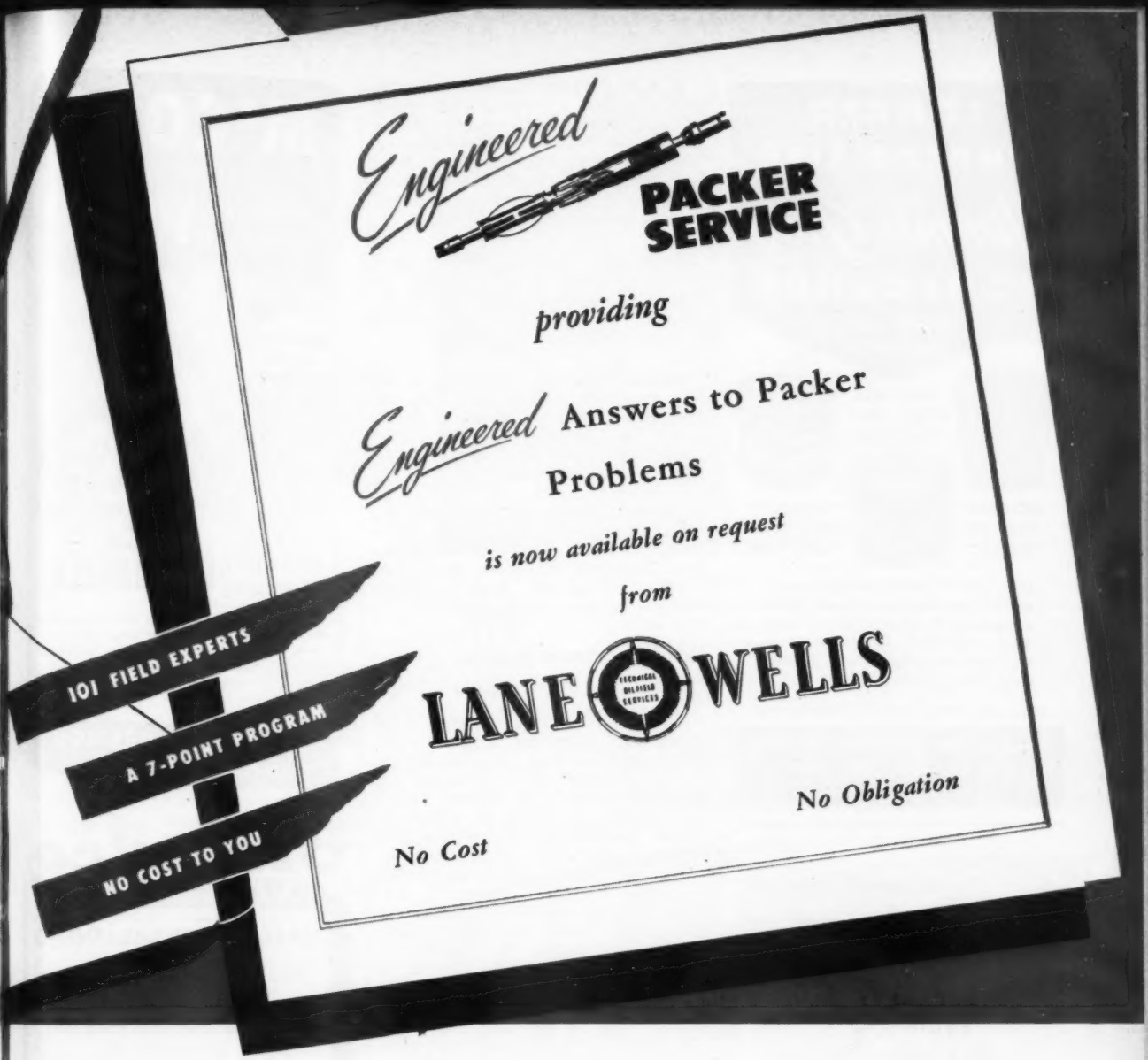
Tools of **Bradley & Leeper Drilling Co.** are working for Easton Oil Co. at 1 Stanley, NW NW SE 8-2s-6w, a projected 3,800-ft. well in the Palacine area, Stephens County, Oklahoma.

Wood Drilling Co., Hoisington, Kans., is the contractor and joint operator with Musgrove Petroleum Corp. on a wildcat test, 1 Nelson, being drilled in the area 3 miles south of Great Bend, northwestern Barton County, Kansas.

Ard Drilling Co., Abilene, Tex., has contracted with Woodley Petroleum Co. and Ring Engineering Co., Inc., for a 6,800-ft. wildcat test to be drilled in the John Chumley Survey 312, 3 miles southeast of Rotan, Fisher County, West Central Texas. The test will be 1 Grindstaff.



J. H. Lowe (left), toolpusher, and W. W. Parmley, driller, W. H. Black Drilling Co., Inc., Midland, Tex., inspect a new traveling block and combination hook recently installed on a portable rig they are running near Snyder, in Scurry County, Texas.



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B. & R. Drilling Co., Wichita, is the contractor on a wildcat test which W. A. Haney of Glenwood, Ia., is drilling in Ottawa County, Kansas. The test is 1 Faidley. The location, in the SW SW NE 27-10-1w, is 25 miles northeast of the Salina pool, Saline County, nearest production.

Gene Reid Drilling, Inc., Bakersfield, Calif., has a rig running for Trico Oil & Gas Co. at 18 Theta, 29-28s-20e, Bacon Hills area, Kern County, California.

Christie Stewart has work under way on a new well he is drilling for E. Dunlap, Jr., of Ardmore, Okla., in the Bayou area, southern Carter County. The well is 3 Hatchett, NE NE SW 26-4s-2w.

Jackson Drilling Co., Wichita, got the contract for a wildcat test which Musgrove Petroleum Corp. and Westgate-Greenland Oil Co. are starting at 1 Popp, SE SE SW 29-16-14, northwestern Barton County, Kansas.

Drilling Upturn Boosts Number of Active Rigs

An increase of 55 in the number of rotary rigs operating in the United States and western Canada during the week ended July 24 (latest report) boosted the total number of active rigs at that time to within 18 of the number running at the first of the month when drilling activity was at its highest level in more than 1½ years.

Active rigs at the first of the month peak totaled 2,329. Declines in drilling activity during the ensuing 2 weeks reduced the total to 2,256, or 73 under the peak. With the increase, the total number of active rigs was 2,311.

Increases in drilling activity were reported in all areas except Oklahoma, in which the number of rigs declined by 21, and the Pacific Coast where there was no change.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 7-24-50	Change week ended 7-17-50	Change week ended 7-25-49
Gulf Coast	518	+14	+ 7
W. Tex.-N. M.	755	+22	+239
Ark.-N. La.-E. Tex.	155	+ 2	— 10
Oklahoma	260	—21	+ 34
Kansas	131	+ 1	+ 12
Illinois-Eastern	160	+30	+ 43
Rocky Mountains	98	+ 2	— 16
Pacific Coast	140	0	— 17
Total U. S.	2,217	+50	+292
Western Canada	94	+ 5	+ 22
Total	2,311	+55	+314

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and in the Rocky Mountain and Pacific Coast areas are shown by graphs on pages 108 and 109.

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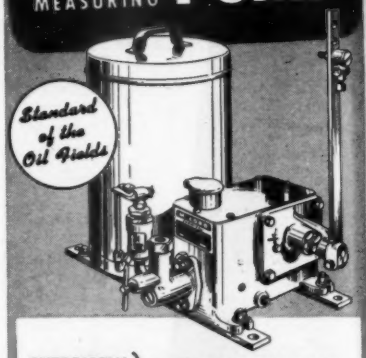

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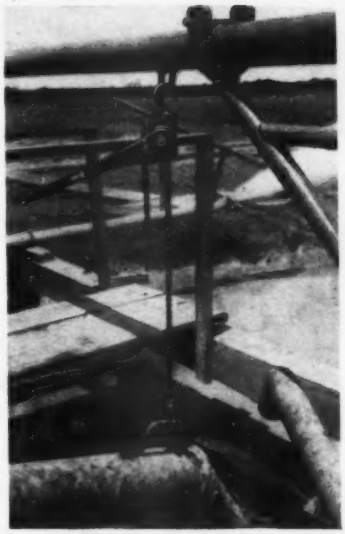

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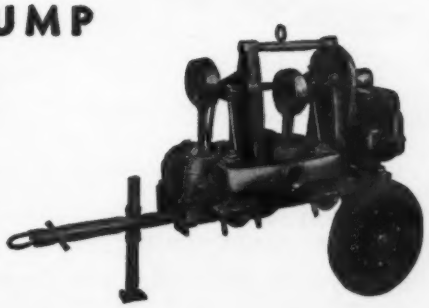

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Exploration and Drilling

Why Doesn't the Salina Basin Produce?

THE abandonment of the most recent hole drilled in the Salina basin, an area that apparently has every generally recognized criteria of an oil province but no production, has once again cooled interest in the pear-shaped region between the Central Kansas uplift and the Nemaha granite ridge, which has been alternately hot and cold for many years.

The location for this hole, Stanolind Oil & Gas Co. 1 Campbell, SW NW NW 26-6s-2w, Cloud County, Kansas, which was abandoned last week, was made on the basis of a composite picture developed by subsurface geological studies, core drill programs, and geophysical surveys, both magnetometer and seismograph. However, in spite of a completely scientific location in what appears to be an area with regional conditions favorable for the accumulation of oil, the hole failed to find oil in commercial quantities, and thus joined the long list of dry holes drilled to the Arbuckle or deeper in the central portion of the basin.

From a surface elevation of 1,396 ft. the following datum tops were reported for Stanolind 1 Campbell: Lansing —518 ft., Mississippian —1,074 ft., Mississippi dolomite —1,127 ft., Kinderhook —1,210 ft., Hunton —1,353 ft., Maquoketa —1,567 ft., Viola —1,634 ft., Simpson —1,844 ft., and Arbuckle —1,921 ft. The hole was bottomed at 3,350 (—1,954) ft.

A 1-hour drill-stem test taken after penetrating 10 ft. of Viola yielded 8 ft. of very slightly oil-cut mud. Another Viola test of the next 5-ft. interval recovered 12 ft. of mud in 30 minutes. After drilling 33 ft. into the Arbuckle a 15-minute drill-stem test unloaded 2,600 ft. of fresh water from Kansas' most important oil-producing formation.

The Salina basin covers an area of 35-40,000 sq. miles. Most of the surface beds within the basin outline are Cretaceous marine shales. The Dakota sandstone lies on a disconformable Permian surface. Both the Permian and the Pennsylvanian are interbedded marine shales and limestones with a basal shale-sandstone series, which is principally of marine origin. These upper Paleozoics extend across the Central Kansas uplift and the Nemaha granite ridge. At the base of the Pennsylvanian there is a major unconformity. During this hiatus the rocks of the Mississippian through the Simpson were cut away from the uplifted areas so that the Pennsylvanian crosses the truncated ends of these rocks on the flanks of the highs, forming favorable porosity wedges. The rocks from the Arbuckle to the basement complex climb high onto the basin's limiting structural features, crossing them in places.

An area as large as the Salina basin, which contains a sedimentary section producing oil in nearby areas, averaging about 3,000 ft. thick, with unconformities and porosity wedges, as briefly described above, cannot be condemned by the 50 or so geologically deep dry holes that have been drilled in the basin to date. However, such a large number of unsuccessful tests is certainly enough to discourage even the wildest wildcatter from the central portion of the basin for a time.

The fact that recent Salina basin tests have had the benefit of all known exploration methods and modern drilling techniques does not mean that what should not have been condemned 20 years ago should be condemned now. Any exploration man knows that in spite of tremendous progress in exploratory methods and the ever increasing accumulation of knowledge about the conditions under which oil may be found in commercial quantities, that there are still too many unanswered questions about the occurrence of oil pools to believe that if they cannot be found with present approaches they are not there.

Those geologists who were once interested in the Salina basin, and have since cooled, do not condemn the area but ask "why doesn't it produce?" They wonder if the answer is in some way tied to the fact that the Salina basin was not a deep depositional trough but rather a comparatively stable area that ended up between two highs?

The strings of oil pools on the northeastern flank of the Central Kansas uplift, which has since, due to tilting, become the crest of that positive feature, is indisputable evidence that the required environment for generating oil existed along the western and southwestern edges of the basin at some time. Could it be that the required environment never existed out in the basin?

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Vickers Petroleum Co. and Norwood Drilling Co. 1 Canning, NE SW 142-25-H&TC, "upper" reef discovery in eastern Borden County, flowed 408.48 bbl. of oil in 12 hours through ½-in. choke from a limestone section at 5,912-37 ft. The pay has been tentatively identified as lower Permian. Location is 3½ miles north of Von Roeder Canyon reef field, and about the same distance west of Canyon production at Diamond M.

ROCKY MOUNTAIN AREA.—British-American Oil Producing Co. has found gas with some oil at its fourth wildcat in northeastern Colorado. Shows have been reported, but not confirmed, in the Basin and Range, Nevada, wildcat being drilled by Continental Oil Co. and Standard Oil Co. of California.

SOUTH LOUISIANA.—Superior Oil Co. has opened a new distillate pool at its L-1 Miami Corp., 34-13s-5w, Cameron Parish, 2 miles southeast of Lake Misere. A ½-mile west extension to Lakeside field, in the same parish, has been completed at Stanolind Oil & Gas Co. 1 Lacassine Co., Inc. (See field report this week.)

XUM

California

Three New Oil Pools Apparently Found

LOS ANGELES.—After several weeks of unsuccessful wildcatting, California operators appear to have located three new oil pools. In the mountains north of the western end of Cuyama Valley, a new discovery seems assured to give that area a total of three so far this year. Near Hanford in Kings County, a wildcat started flowing at the rate of 125 bbl. daily and is in the process of being completed. Near Huron in Fresno County, scout reports indicate a third discovery may be in the making.

The northwestern Cuyama wildcat, Hancock Oil Co. 44-31 Hancock-Bishop in 31-32s-20e and 2½ miles northwest of the Morales field, on a drill-stem test at 5,860-5,964 ft. yielded 3,011 ft. of 34°-gravity crude. Based on the rate of fill-up it was estimated the well was a 750-bbl. producer. Following the test, however, the operator continued coring to total depth of 6,097 ft. and in pulling pipe from the hole the core barrel and about 500 ft. of drill pipe was stuck. At last reports Hancock was attempting to retrieve the fish.

Kings County's new discovery, Goshen Syndicate 2 Drummond-Union in 36-18s-22e, was being swabbed at last reports in an effort to establish flowing production. Earlier the wildcat started flowing 19°-gravity oil at the rate of 125 bbl. daily but it then died. Total depth is 5,404 ft. with 5½-in. casing set at 5,389 ft. Nearest oil production is the Riverdale field, about 18 miles northeast.

General Petroleum Corp. has nothing to say on the potentialities of its 44-14 Boston Land Co. but if scouts are correct it is a new discovery for Fresno County. Hole has been bottomed at 13,621 ft. and 7-in. casing cemented at 13,330 ft. At the weekend the operator was running 2⅞-in. drill pipe to drill out the plug. Site of the wildcat is in 14-20s-18e, about 15 miles east of East Coalinga production.

Little hope apparently exists for possibilities of the southeast extension area of the Long Beach field developing into sizable production. Jerman & Bartee opened flank production at 6,400 ft. about 6 weeks ago when its 2 Webb was completed as a 900-bbl. daily flowing producer. Last week Jergins Oil Co. abandoned two close-by offsets after carrying them to 6,889 and 6,705 ft., respectively, without finding any oil shows. Drilling at two other nearby wells has been suspended pending outcome of Jerman & Bartee 1 D & J and 1 Donahoo Community. The former was last reported as coring at 6,793 ft., while the latter was being whipstocked at 6,425 ft.

In Signal Hill townsite to the northwest, the drilling boom to the recently discovered shallow sand likewise is slowing down. Some 30 wells have been drilled to, or plugged back and recompleted in the 2,300-ft. pay discovered by Jack C. Rogers 1 Enterprise. Many of these were completed with high rates of water production.

New wildcats.—Among the new wildcats staked in northern California was Hancock Oil Co.-Signal Oil Co. 41-19 A. R. Hansen in Alameda County. Site is in 19-3s-3e, about 5 miles southeast of Livermore and 20 miles southeast of Oakland. In Sacramento County, Standard Oil Co. of California was rigging up rotary for a test ½ mile northwest of the town of Isleton and east of the Rio Vista gas field. Known as 1 Wilmars Land Co., the test is to be drilled in 26-4n-3e.

In Cuyama Valley, Richfield Oil Corp. has staked location for a wildcat about 1½ miles east of Russell Ranch field. Known as 61-9 Russell-A, location is in 9-10n-27w.

CALIFORNIA UNSUCCESSFUL WILDCATS

Kern County, north Comanche Point area: C.C.M.O. Co. 3 Tejon Ranch, 23-32s-29e, dry, bottomed in basement, TD 2,056 ft., elev. 556 ft.

Tejon Hills area: Lee Clayton 1 Clayton, 14-11n-18w, dry, bottomed in Santa Margarita, TD 939 ft., elev. unknown.

San Luis Obispo County, Cholame area: Keloil, Inc., 3 Jack, 17-25s-16e, dry, TD 1,200 ft., elev. unknown.

Northwest Cuyama area: Peak Oil Tools Service 81-16 Stone, 16-11n-28w, dry, bottomed in siltstone, TD 3,487 ft., elev. unknown.

Sacramento County, Rio Vista area: Brazos Oil & Gas Co. 1 Staten Island, 4-3n-4e, dry, Ione 3,814 ft., River Island 4,311 ft., Capay 4,413 ft., Midland 4,575 ft., TD 4,653 ft., elev. sea level.

Tulare County, Ducor area: Frank & Thomas Cannella 2 Exploration, 20-24s-28e, dry, TD 567 ft., elev. 700 ft.

Oklahoma

Gas-Distillate Discovery Given Cleveland County

BENSON & MONTIN's new Bartlesville sand discovery well south of Corbett in southeastern Cleveland County was flowing an estimated 30,000,000 cu. ft. of gas daily with a spray of distillate while cleaning out. The well, 1 Pearcy, SW SW SE 30-6n-1e, had the Bartlesville sand at 5,765 ft. The new flow is from casing perforations at 5,795-5,814 ft. Flowing pressure was 300 psi., and when the well was shut in, pressure built up to 2,150 psi. on the casing and 1,900 pis. on the tubing.

Total depth of the hole is 6,851 ft. in the second Wilcox sand, topped at 6,815 ft. Casing was run to 6,847 ft. Tests in the Wilcox showed considerable water. Viola lime also was tested with casing perforations at 6,491-6,503 ft. but showed only a small amount of gas and oil.

Another gas-distillate pool is being opened in Coal County where J. A. Roberson is testing his 1 Pope, C W½ SW NE 34-1n-9e. Information has been withheld by the operator, but the well is reported to have flowed at the rate of 12,000,000 cu. ft. of gas with an estimated 100 to 150 bbl. of distillate daily through 20/64-in. choke before being shut in for separator connections. Production is from McLish sand, in which casing is reported to have been perforated at 7,173-80 ft. Top was given at 6,165 ft. with surface elevation of the well at 734 ft. Prior to testing, hole had been drilled to a total depth of 7,305 ft. Casing is at 7,246 ft. The location is 8 miles west of Coalgate and 6 miles south of the small Centrahoma pool, nearest production, which produces from the Cromwell sand.

An-Son Petroleum Corp. is completing what is expected to make one of the best wells to date in the newly developed Chimney Hill (Hunton lime) zone in the west portion of the St. Louis district, Pottawatomie County. The well is 1 Hines, located just east of the Pearson townsite in the SE SW SW 17-7n-4e. It flowed 100 bbl. of oil in the first 20 minutes after being acidized with 5,000 gal. with flow through open 5½-in. casing. Later, it flowed up to 55 bbl. per hour. The zone has casing perforated at 3,999-4,030 ft. and at 4,054-74 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Cleveland County: Gulf Oil Corp. et al 1 Wilson est., NE N NE 27-10n-1e, 4½ mi. W Union Point, discovery of East Stella pool elev. 1,143 ft., flowed estimated 988 bbl. of 38°-gravity oil per day from dolomite at 6,072-78 ft. and 8,109-19 ft., TD 6,285 ft., Pawhuska lime 2,450 ft., Avant 3,470 ft., Belle City 3,850 ft., Hogshooter 4,365 ft., Checkerboard-Morrow 4,620 ft., Checkerboard lime 4,660 ft., conglomerate 4,830 ft., Oswego 5,385 ft., Prue 5,395 ft., Hunton 4,701 ft., Sylvan 5,900 ft., Viola 6,002 ft., second Wilcox 6,242 ft.

H. Brown et al 1 Miller, NW NW NW 32-10n-2w, ½-mi. S extension to new NW Clother pool, elev. 1,139 ft., dual completion: flowed 56 bbl. of 41°-gravity oil per day from second Wilcox at 7,328-36 ft. and 320 bbl. of 38°-gravity oil per day from Oil Creek at 7,992-8,044 ft., TD 8,156 ft., Hogshooter 5,585 ft., Oswego 6,582 ft., Bartlesville 6,721 ft., basal Pennsylvanian-Hunton 6,835 ft., Sylvan 6,907 ft., Viola 6,998 ft., dolomite 7,092 ft., McLish 7,572 (?) ft., Joins 8,184 ft.

Creek County: Falcon-Seaboard 1 Kimble, NW SW SW 22-14n-10e, ⅝ mi. E Tuskegee, elev. 773 ft., pumped 20 bbl. of oil per day from Misener at 3,258-64 ft., TD 3,394 ft., Woodford 3,239 ft., Viola 3,318 ft., dolomite 3,362 ft., Wilcox 3,372 ft.

Garvin County: Amcan Oil Corp., Inc. 1 Hays, C SW NW 27-4n-3w, elev. 1,037 ft., flowed 87 bbl. of 43°-gravity oil per day from first Gibson sand at 7,120-38 ft., TD 7,322 ft., Gibson 7,092 ft., Hart sand 7,190 ft., Springer 7,300 ft., Mississippi-Caney 7,310 ft.

OKLAHOMA WILDCAT FAILURES

Beckham County: Wilcox Oil Co. 1 Dugger, C NW SE 12-10n-23w, elev. 1,920 ft., dry, TD 11,654 ft., shale and lime 4,880 ft., black hard lime 4,910 ft., sandy lime 5,002 ft., porous granite wash 10,-148 ft., 10,160 ft., 10,176 ft. (all no shows), 10,268 ft. and 10,294 ft. (very slight possibility), 10,456 ft. (water), broken porous granite wash 10,514 ft. (water).

Cotton County: R. Benton Ross 1 Way-sepappy, SW SW NW 32-4s-13w, elev. 1,046 ft., dry, TD 3,034 ft., fusilinid sand 1,842 ft., lime 1,864 ft., sand 1,952 ft. and 2,264 ft., sandy lime 2,276 ft., Canyon lime 2,620 ft., sandy lime 2,916 ft., lime 2,935 ft., 2,954 ft., and 3,015 ft.

Creek County: Brosius & Hall 1 Spurgeon, NE NW NE 13-17n-8e, Olive district, elev. 899 ft., dry, TD 3,161 ft., Oswego 2,137 ft., Prue 2,218 ft., Skinner 2,403 ft., no Red Fork, Inola 2,710 ft., Bartlesville 2,736 ft., lime 2,872 ft., Burgess 3,125 ft., Mississippi lime 3,160 ft.

Hughes County: Tony Lyons et al 1 Stillwell, NW SW SW 16-7n-9e, 1 mi. S of E Holdenville, dry, TD 972 ft. in broken sand and shale.

Jefferson County: L. S. Dennis 1 Seay, NW SE NW 27-6s-5w, elev. 835 ft., dry, TD 2,022 ft., broken sand 1,850 ft., crinoidal lime 1,986 ft., Arbuckle dolomite 2,003 ft.

Kiowa County: Blaine County Royalty 1 Rudd, SW SW SW 27-7n-16w, Gotebo district, dry, TD 478 ft., sand 444 ft. (slight show of oil) and 447 ft.

H. J. Heartwell 1 Baker, C NE NW 7-6n-18w, dry, TD 1,155 ft., sand 1,151 ft., show of gas.

Can-Lew Oil Co. 1 Herington, NE NE NW 32-7n-17w, dry, TD 850 ft., sand 735 ft.

Lincoln County: Creekmore-Rooney et al 1 Amerman, SE SW SW 28-14n-6e, ½ mi. N of NW Laffoon, elev. 777 ft., dry, TD 3,162 ft., Hogshooter 1,810 ft., Layton 1,823 ft., Checkerboard 2,189 ft., conglomerate 2,219 ft., Oswego 3,029 ft., Prue 3,101 ft., Verdigris 3,121 ft.

Love County: Anderson-Prichard 2 Wilkins, SE SE SE 8-6s-2e, dry, TD 2,104 ft., Springer 178 ft.

Osage County: Norbla et al 1 Osage, NE NE NE 5-26n-5e, 3 mi. W Burbank, dry, TD 3,110 ft., Big lime 2,704 ft., Oswego 2,810 ft., Burbank 3,020 ft., Mississippi lime 3,098 ft.

Stephens County: L. A. Edwards, Jr. 1 Mann, NW SE SW 28-2s-6w, dry, TD 2,575 ft., Loco lime 1,726 ft., limy sand 2,536 ft.

Tillman County: E. L. Pinkston and C. D. Davis Dudenhoefer, SW SE SE 8-3s-14w, elev. 1,055 ft., dry, TD 4,500 ft., Canyon 2,930 ft., Strawn 3,570 ft., Simpson 4,315 ft.

Kansas

Meade County Wildcat Makes Good Gas Flow

SKELLY OIL CO. appears to have a good gas well at its 1 McKinney, NW NW NE 2-34-26, a rank wildcat in southern Meade County, in the southwestern part of the state. Producing from two zones in the Mississippian, the well flowed at the rate of 14,755,000 cu. ft. of gas daily. Nearest production of any kind is in the small East Adams Ranch pool, about 25 miles to the southwest, which produces gas from the Morrow sand (Pennsylvanian) and upper Mississippian. It is 8 miles north of the Oklahoma line.

Casing, run through the two zones and bottomed at 5,900 ft., first was perforated in two intervals of a lower zone at 5,811-17 ft. and 5,822-28 ft. With 1,000 gal. of acid applied, the well flowed at the rate of 3,400,000 cu. ft. of gas daily. An additional 4,000 gal. of acid increased the flow rate to 4,830,000 cu. ft. daily.

Packer then was set above this zone at 5,802 ft. and from casing perforations at 5,762-92 ft. in the upper zone and following a 5,500-gal. acid treatment, the well flowed at the rate of 5,690,000 cu. ft. of gas daily. Both zones then were opened, resulting in the daily flow of 14,755,000 cu. ft. daily.

Production of the North Hammer pool, northwest of Ellenwood, southeastern Barton County, is being extended more than ½ mile to the north and west of Alpine Oil & Royalty Co. 1 Schartz, NE NE NW 15-19-12. Testing Lansing-Kansas City lime, in which casing was perforated at 3,167-75 ft., the well flowed 150 bbl. of oil in the first 2 hours after a 700-gal. acid application. Top of the Lansing is 3,149 (—1,305 ft.). Prior to testing this zone, hole had been drilled to 3,447 ft. in the conglomerate, in which casing was run to 3,445 ft.

Alpine has another prospective oil discovery well in southeastern Barton County at its 1 Hartman, SE SE NE 28-10-11, about 5 miles southeast of the North Hammer pool. It encountered pomising oil showings in Arbuckle lime, logged at 3,340-45 ft. (—1,559-64 ft.), and has 4½-in. casing run for testing. Casing was landed 2 ft. in the top of the pay.

The latter well is about 1¼ miles to the southeast of a new pool, opened by the same company at its 1 Kowalski, SE SE NW 20-19-11. Although as yet not officially completed, the Kowalski well flowed at rates as high as 100 bbl. per hour in initial tests. Its production is from Lansing-Kansas City lime in which casing was perforated at 3,080-3,116 ft. It also was drilled to the Arbuckle, logged at 3,369-74 ft., but was unproductive in that zone. Lansing was topped at 3,078 ft. (—1,289 ft.).

Derby Drilling Co. 1 Jacobs, NW NW SW 21-13-17, ¾ mile southeast of production in the Sugar Loaf pool and about a mile south of the Catherine pool, Ellis County, swabbed at the rate of 57 bbl. of fluid, 85 per cent oil, in preliminary tests of a Lansing-Kansas City lime interval, in which casing was perforated at 3,391-99 ft. Top of the Lansing is 3,322 ft. (—1,305 ft.). Hole was plugged back from a total depth of 3,713 ft. in unproductive conglomerate. Casing had been run to 3,476 ft. The well may prove a link in connecting the above two pools although a dry hole has been drilled between it and the Sugar Loaf pool.

Deepened in Simpson sand, in which additional promising oil and gas showings have been encountered, The Texas Co. 1 Hobbisiefkin, SW NE SW 3-35-3w, prospective discovery well in southern Sumner County, in the extreme southern part of the state, has casing run in the upper part of the zone for completion tests.

Hole was deepened to 4,779 ft. Final drill-stem test took in the bottom 13 ft. (4,767-79 ft.). Tester was open 1 hour and 50 minutes. Gas was at the surface within 1 hour and 35 minutes, and in the breakdown, the recovery was 120 ft. of oil and gas-cut mud. Top of the Simpson sand zone had been marked at 4,740 ft. (—3,613 ft.). In a 2-hour drill-stem test at 4,751-61 ft. gas flowed within 12 minutes and at the end of the test there was 135 ft. of distillate in the pipe. Good oil and gas showings previously had been found in the Kansas City lime, topped at 3,608 ft. (—2,481 ft.), and the Mississippi, topped at 4,294 ft.

KANSAS SUSCESSFUL WILDCATS

Barton County: Lewis Drilling Co. 1 Schartz "A," SE SE NE 15-19s-12w, elev. 1,850 ft., 1,394 bbl. of oil per day from Lansing Kansas City at 3,146-76 ft. and 3,184-3,204 ft., TD 3,443 ft., Topeka 2,751 ft., Heebner 3,009 ft., lime 3,128 ft.

Anschutz 1 Batchman, SE SE SE 19-20s-12w, elev. 1,858 ft., 180 bbl. of oil per day from Arbuckle at 3,459-80 ft., TD; anhydrite 670 ft., Heebner 3,068 ft., lime 3,190 ft., Lansing-Kansas City 3,203 ft.

Graham County: Jones-Shelburne & Farmer 1 Miller, NW NW NW 11-10s-21w, elev. 2,283 ft., 3,000 bbl. of oil per day from Arbuckle at 3,841-49 ft., TD; anhydrite 1,780 ft., Topeka 3,278 ft., Heebner 3,489 ft., Lansing-Kansas City 3,525 ft., Simpson shale 3,823 ft., Simpson dolomite 3,832 ft.

Rooks County: Berwick-Isern 1 Carmichael, SE SE SE 33-9s-17w, elev. 2,096 ft., 447 bbl. of oil per day from Arbuckle at 3,516-27 ft., TD; Heebner 3,198 ft., Dodge 3,215 ft., Lansing-Kansas City 3,240 ft., Simpson 3,500 ft.

Saline County: Sheldon et al 1 Olson, NW NW NE 11-16s-3w, elev. 1,281 ft., pumped 55 bbl. of oil per day from Viola dolomite at 3,404-13 ft., TD; Lansing 2,160 ft., basal Kansas City 2,526 ft., Mississippian 2,825 ft., Kinderhook 3,106 ft., Maquoketa shale 3,272 ft., Maquoketa dolomite 3,345 ft.

KANSAS WILDCAT FAILURES

Barber County: Rine-Gore 1 Bergner, NE NE NE 10-31s-11w, elev. 1,806 ft. DF and 1,803 ft. Gr., dry, TD 5,015 ft., Lansing 3,926 ft., Mississippi lime 4,486 ft., Kinderhook 4,622 (?) ft., Viola 4,760 ft., Simpson sand 4,854 ft., Arbuckle 4,970 ft.

Barton County: Lindas 1 Hejny, NW NW NE 1-17s-15w, elev. 1,988 ft. DF and 1,986 ft. Gr., dry, TD 3,555 ft., anhydrite 987 ft., Heebner 3,184 ft., Lansing-Kansas City 3,248 ft., Sooy 3,494 ft., Arbuckle 3,523 ft.

Cowley County: Watson-Gralapp 1-A Palmer, NE NW NE 22-34s-3e, elev. 1,075 ft. DF and 1,072 ft. Gr., dry, TD 3,321 ft., Stalnaker (?) 2,120 ft., Kansas City 2,770 ft., Bartlesville 3,250 ft., Mississippian 3,321 ft.

Ellis County: Armer 1 Smith, SE SE SW 6-15s-19w, elev. 2,028 ft. DF and 2,026 ft. GR., dry, TD 3,698 ft., Topeka 3,060 ft., Heebner 3,290 ft., Toronto 3,309 ft., Lansing-Kansas City 3,335 ft., Regan 3,665 ft.

Derby-Peel-Hardman 1 Kinderknecht, SW SW NE 8-114s-19w, elev. 2,213 ft., DF and 2,210 ft. Gr., dry, TD 3,884 ft., Heebner 3,473 ft., Toronto 3,496 ft., Lansing-Kansas City 3,520 ft., cherty Sooy 3,818 ft., sand Sooy 3,848 ft., show of dead oil 3,544 ft. and 3,848 ft.

Ellsworth County: Stearns 1 Dolezal, NE NE NW 17-15s-7w, elev. 1,664 ft., dry, TD 3,514 ft., Dodge 2,586 ft., lime 2,684 ft., Lansing-Kansas City 2,704 ft., show of oil 2,810 ft. and 2,900 ft., Mississippi lime 3,150 ft., Kinderhook 3,250 ft., Viola 3,353 ft., Simpson 3,433 ft., Arbuckle 3,481 ft.

Graham County: Gore 1 White, SE SE SW 7-6s-21w, elev. 2,285 ft. DF and 2,283 ft. Gr. dry, TD 3,845 ft., Topeka 3,310 ft., Heebner 3,499 ft., Dodge 3,525 ft., Lansing-Kansas City 3,547 ft., Sooy 3,782 ft., Arbuckle 3,811 ft.

B.H.P. Oil Co. 1 Eichman, SE SE NW 31-9s-21w, elev. 2,319 ft. DF and 2,316 ft. Gr., dry, TD 3,948 ft., anhydrite 1,795 ft., Lansing-Kansas City 3,547 ft., Sooy 3,833 ft., no Arbuckle.

Rice County: Lauck 1 Hager, NE SW NW 20-19s-10w, elev. 7,776 ft., DF and 1,773

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Gr., dry, TD 3,388 ft., Heebner 2,870 ft., lime 2,989 ft., Lansing-Kansas City 3,014 ft., Sooy 3,324 ft., Arbuckle 3,342 ft.

Stafford County: Musgrove 1 Grow, NE NE NW 28-21s-12w, elev. 1,857 ft. DF and 1,854 ft. Gr., dry, TD 3,660 ft., anhydrite 665 ft., Heebner 3,131 ft., lime 3,268 ft., Lansing-Kansas City 3,281 ft., Sooy 3,520 ft., Simpson 3,552 ft., Arbuckle 3,609 ft.

EASTERN NEBRASKA WILDCAT FAILURE

Saunders County: Todd Valley Development 1 Koutney CSL NE NW 11-15n-7e, elev. 1,245 ft. Gr., dry, TD 2,700 ft., Lansing 375 ft., Marmaton 600 ft., Cherokee 692 ft., Mississippi lime 765 ft., Hunton 840 ft., Viola dolomite 1,357 ft., Simpson shale 1,519 ft., Simpson sand 1,567 ft., Arbuckle 1,617 ft., base sand 1,686 ft., granite was 1,693 ft.

Southwest Texas

Potential Taken on Oiler In Cooksey Area

CORPUS CHRISTI.—Lee & Hardcastle of San Antonio phave a potential test on 1 M. Penaniezk, oil discovery in the Cooksey area of Bexar County. The well produced 25 bbl. of 38°-gravity oil per day via gas lift through perforations at 1,558-620 ft. There was no water encountered on the test and gas-oil ratio was nil. The new producer is located in the J. W. Rialls Survey 11, approximately 5 miles east of San Antonio.

Sunray Oil Corp. has abandoned 1 O. W. Killam, deep wildcat test 14 miles east of Laredo in Webb County. The well was drilled to a total depth of 13,706 ft. and operators perforated from 7,995-8,018 ft., acidized with 2000 gal. of acid, ran a test and recovered 150 ft. of gas-cut mud. The test was then acidized with 2,000 more gallons of acid, and drill-stem tested for 2½ hours, using 1,500-ft. water cushion. There was a strong blow to zero in 30 minutes, recovering 1,500 ft. of water cushion, 450 ft. of mud cut with gas. Operators then abandoned the test and turned it back to Brewster-Bartle and F. A. Gillespie & Sons. It is not known whether or not they will further explore the test.

Approximately 3½ miles west-northwest of Hebbronville, in Jim Hogg County, Killam & Hurd, Inc., has run an open-hole potential test on its new oil discovery, 2 C. W. Hellen. The well pumped 69 bbl. of 38.5°-gravity oil per day through open hole at 3,065-69 ft. Operators drilled the hole to a depth of 3,069 ft. and set 5½-in. casing on top of the sand at 3,064 ft.

In Duval County, Holly Development Co. and Barbara Oil Co. cored the Dougherty oil sand at 2,683-708 ft. in their 25 Driscoll Estate, wildcat test 14 miles west of Benavides. Hole is bottomed at 2,780 ft. and operators set 7-in. casing at total depth and are now waiting on cement before perforating for test.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Bastrop County: C. L. Hurst, et al, 1 M. C. Callahan, Samuel Wolfenbarger Sur., 11 mi. S of Bastrop, dry, TD 2,700 ft.
W. K. Powell 1 Otto A. Wolter, Michael Green Lg., 2 mi. NE of Elroy, dry, TD 1,252 ft.

Bexar County: George H. Shelton 1 E. H. & Clara Parsons, Samuel McCulloch, Jr., Sur. 54, dry, TD 725 ft.

Caldwell County: Miller-Wells, Inc., 1 J. A. Baker, Geo. W. James Lg., 7½ mi. NE of Lockhart, dry, TD 2,804 ft.

Duval County: Argo Oil Corp. A-2 Lucile Gruy, M. E. Gussety Sur., 23 mi. W of Benavides, dry, TD 2,908 ft.
Bridwell Oil Co. B-1 Nueces Land & Livestock Co., William S. Speed Sur. 112, A-1,887, dry, TD 3,510 ft.

Nueces County: Atlantic Refining Co. B-1 W. F. L. Lehman, Sec. 25, Laureles Farm tracts, 10 mi. SW of Corpus Christi, dry, TD 5,600 ft.

San Patricio County: S. H. Howell 1 Katherine Clifton, V. Juarez Sur. A-11, NE of Mathis, dry, TD 5,263 ft.

Louisiana-Arkansas

McAlester Testing at Columbia County Well

SHREVEPORT.—McAlester Fuel Co. 1-A Medlock, NE NE 7-16s-18w, Columbia County, prepared to run a second drill-stem test in the Smackover, after cores recovered porous limestone with shows of oil and a drill-stem test recovered some gas.

Top on the Smackover was 6,492 ft., on elevation of 206 ft. First core reported had non-porous lime with a slight show of oil from 6,491-96 ft., and a 20-minute drill-stem test of the same interval recovered 25 ft. of mud with light gas show. A core from 6,498-6,505 ft. yielded non-porous lime with no shows, but from 6,505-15 ft. there was a 3½-ft. recovery of fairly porous oolitic lime with a show of oil. Operators were preparing to test the latter section.

C. H. Murphy 1 Concannon, SE NE 29-19s-18w, northwest offset to the Tubal field discovery, in Columbia County, was drilling below 7,982 ft. in shale. Cores from 7,707-13 and 7,713-23 ft. recovered some sand with oil shows. A drill-stem test at 7,707-13 ft. failed mechanically.

C. H. Murphy 1 Emon, NW NE 20-18s-18w, 3 miles south of the Spotsville field, was drilling in shale at 7,757 ft.

Northeast of the Haynesville field, Austin Stewart 1 Mullins, SW SE 23-19s-20w, a Pettit test, was drilling in shale at 3,120 ft.

Lee & Markham Production Co. 1 Frost Trust, 35-16s-26w, Miller County, was drilling sand and shale at 1,623 ft. Projected depth was 5,000 ft. Location is on a subsurface prospect.

T. L. James & Co. 1 Clark Heirs, 30-19s-12w, Union County, had total depth at 2,339 ft. in the Nacatoch and was pumping wash water with a show of oil from open hole at 2,313-39 ft. Top on the Nacatoch was 2,317 ft.

In Catahoula Parish, H. J. Strief 2 W. S. Peck, 42-10n-8e, was drilling in the upper Cretaceous at 7,928 ft., following a core from 7,877-7,927 ft. which recovered 50 ft. of sand and shale with no shows.

Continental Oil Co. 1 Wideman, 21-21n-7w, Claiborne Parish, was drilling in Cotton Valley shale at 6,682 ft. A core from 6,466-6,551 ft. recovered shale and lime, with some sandstone having a slight oil show. A 1-hour test at 6,483-6,551 ft. produced a light blow and recovered 60 ft. of lightly gas-cut mud. Core recovery from 6,576-6,606 ft. was lime, shale and slightly porous sand with light oil show.

Stanolind Oil & Gas Co. 1 Meadors, 8-22n-5w, was drilling below 9,463 ft. in shale.

David M. Lide 1 Outlaw, 46-13n-12e, Tensas Parish, was drilling below 8,103 ft. in the upper Cretaceous. A core from 7,750-57 ft. recovered fine-grained sand and shale with no shows.

Two miles southwest of Doyline, W. M. Plaster 1 T. P. Bass, 30-18n-10w, Webster Parish, was drilling ahead at 7,190 ft. after moving in heavier rig. Base of the massive anhydrite was placed at 6,295 ft.

NORTH LOUISIANA WILDCAT FAILURES

Concordia Parish: Honolulu Oil Corp. 1 S. L. Winston, 43-7n-9e, dry, TD 6,810 ft., elev. 60 ft., Cockfield 2,045 ft., Cook Mountain 2,595 ft., Sparta 2,828 ft., Cane River 3,610 ft., Talahatta 3,915 ft., Wilcox 4,065 ft., base big shale 5,360 ft.

DeSoto Parish: Sterling Oil & Gas Co. 1 L. M. Rambin, NW NE NW 29-11n-11w, TD 5,502 ft., elev. 264 ft., Blossom 1,801 ft., Tokio 1,990-2,023 ft., base Austin

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2,743 ft., Glen Rose 3,207 ft., base Massive anhydrite 5,150 ft., Rodessa 5,198 ft.

Sabine Parish: Jack Manning 1 Sabine Lumber Co., approx. NE NE SW 13-8n-13w, dry, TD 3,622 ft.

Union Parish: T. L. James & Co. 1 J. T. Burden, SE NW NW 36-23n-2w, dry, TD 9,190 ft.

ARKANSAS WILDCAT FAILURES

Calhoun County: Mid-Century Petroleum Corp. 1 Freeman-Smith Land Co., NW NE SE 17-15s-13w, dry, TD 2,761 ft., elev. 110 ft.

Clark County: Garland Anthony Oil Co. 1 Cabe, SW NW SW 21-10s-20w, dry, TD 1,390 ft.

Ouachita County: J. S. Rushing 1 Camden Coal & Clay Co., NW NE SW 15-12s-18w, dry, TD 5,021 ft.

Sevier County: Rambo & Stephens Oil Co. 1 John T. Sharp, CS6 NW 23-10s-29w, dry, TD 200 ft.

South Louisiana

Superior Completes Well For 189 Bbl. Daily

NEW ORLEANS.—Superior Oil Co. completed its L-1 Miami Corp., 34-13s-5w, Cameron Parish, for a gas-distillate discovery 2 miles southeast of Lake Misere. On potential, the well flowed 189 bbl. of 54.9°-gravity oil daily through a 6/64-in. choke. The well is bottomed at 13,751 ft. and is producing through perforations at 8,890-96 ft.

Stanolind Oil & Gas Co. has completed its 1 Lacassine Co., Inc., for a west extension to the Lakeside field, in Cameron Parish. Through perforations at 9,974-90 ft., the well flowed 22 bbl. of 51.6°-gravity distillate per day plus 1,121,000 cu. ft. of gas through ⅛-in. choke, with tubing pressure of 2,990 psi. Operators drilled the hole to a depth of 11,300 ft. and set 7-in. casing to 10,276 ft. The well, located in 23-12s-5w, extends the field approximately ½ mile westward. It is possible that the well will prove to be a new pay zone for the field. The field now has about 6 wells which are producing from what is known as the 9,800-ft. sand.

In Rapides Parish, Texas Pacific Coal & Oil Co. is waiting on cement to begin testing its promising find, 1 W. M. Elliott, 4 miles south and 2 miles east of Glenmora. Operators have set pipe to total depth of 10,812 ft. No information has been revealed on thickness and location of the oil sands encountered in the well.

At St. Bernard Parish's most interesting wildcat in some time, Richardson & Bass are wating on cement to set at 1 Albert Ruiz, 136-14s-14e, approximately 7 miles southeast of the Kenilworth gas field, Seven-inch casing has been set to total depth of 12,599 ft., and operators plan to drill deeper.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

Cameron Parish: Gas-condensate discovery—Superior Oil Co. L-1 Miami Corp., 34-13s-5w, top pay 8,896 ft., perf. 8,890-96 ft., TD 13,751 ft., IP: 189 bbl. distillate per day plus 70,000 cu. ft. of gas, 6/64-in. choke, TP 1,360 psi., 54.9° gravity.

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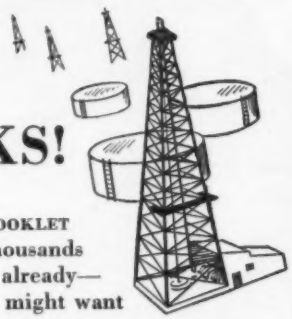

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Eastern Texas

Test Near Sandusky May Bring in Simpson Production

DALLAS.—In northwest Grayson County, ½ mile east of the town of Sandusky, L. O. McMillan 1 Chambers, W. D. Fisher Survey, A-434, had possible production in the Simpson, Lower Ordovician. First perforations, later squeezed, from 7,187-91 ft. flowed an estimated 15-20 bbl. of fluid an hour, which was about ½ water. Perforations from 7,187-89 ft. produced a flow of 23 bbl. of oil an hour for 6 hours, with no water, through 3/16-in. choke. Flowing pressure was 1,650 psi. and bottom-hole pressure was 3,450 psi. If successfully completed, it will be the first Simpson production for the county, and the second Simpson area for northern Texas. Location may prove to be a continuation of the northwest-southeast trend of fields in southern Oklahoma.

In Cherokee County, Roosth & Genecov Production Co., Tyler, was preparing to abandon its 1 Whiteman-Decker, attempted confirmation test to the one-well South Pine field, 10 miles west of the Alto townsite. Total depth was 5,320 ft. There were no commercial shows in the Woodbine sand. Location was on a block of approximately 1,000 acres, and 1,500 ft. northeast of the discovery well, Geier-Jackson 1 Southern Pine Lumber Co., which flowed 175 bbl. of oil a day in the Woodbine sand at 5,313-31 ft. The 1 Whiteman-Decker was the fourth dry test to be drilled within 1,500 ft. of the discovery.

Union Producing Co. was reported building derrick at its 1 J. W. Gilchrist, ½ mile southwest of the same company's 1 Saunders, Woodbine gas discovery in the Mixon area of Cherokee County.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Cherokee County: Roosth & Genecov Production Co. 1 Whiteman-Decker, I&GN Sur., A-420, 10 mi. W Alton, 600-acre tract, dry, TD 5,320 ft.

Hunt County: A. O. Phillips 1 J. W. Green, J. A. Jones & J. M. Rush Sur., 3 mi. SW Quinlan, dry, TD 4,573 ft., elev. 504 ft., Goodland 4,350 ft. by samples.

Walker County: L. M. York 1 Luther E. Hall, C. A. Sleight Sur., A-496, 3 mi. NW New Waverly, dry, TD 3,630 ft. in shale.

Rocky Mountain

B.-A. Wildcat Tests Oil And Gas at 4,978 Ft.

DENVER.—Gas and oil has been recovered on a series of tests in the latest British-American Oil Producing Co. wildcat in the northeastern Colorado area. The well, 1 Green, NW NE SE 20-9n-53w, in the Walker area, Logan County, on two tests showed more than 8,000,000 cu. ft. of gas daily. On the test between 4,978-93 ft., the well made 102 ft. of fluid, including 47 ft. of free oil, with 3,680,000 cu. ft of gas. An additional 120 ft. of oil, with some water, was recovered on test 4,993-5,009 ft., and on a test 5,009-19 ft., the well made 1,500 ft. of water, with some oil and gas shows. This wildcat is the fourth in a series by British-American on lands held jointly by the company and Plains Exloration Co. of Denver. Plains has joined in operations on all wells to the present one, and will alternate on future drilling with British-American. The operators have made one oil discovery, in the Armstrong area, 12 miles north of the present wildcat.

Activity in the Denver-Julesburg Basin has increased in recent weeks and there are now more than 14 wildcats under way and planned in the basin. Stanolind Oil & Gas Co. has farmed out acreage spreads through its extensive Garden-Morrill counties play in Nebraska, and Kerr-McGee Oil Industries, Inc., will drill a series of three wells on seismic highs through the area for interest with Stanolind. Stanolind drilled two wildcat failures through the area recently. National Associated Petroleum Co. has announced location for 1 McFaddin, SW SE SE 10-6n-38e, southeast of the town of Imperial in Chase County. Deep Rock Oil Corp. and Frontier Refining Co. have made location for 1 Siemers, SW SW SW 6-14n-49w, in the Huntsman area of Cheyenne County. The Texas Co. has made location for 1 Miller, CSW NW 13-15n-47w, 15 miles east of the Huntsman area, in Cheyenne County.

Reports have been circulated concerning oil shows in the rank wildcat being drilled by Continental Oil Co. and Standard Oil Co. of California at their Meridian wildcat, White Pine County, Nevada. This well, 1 Meridian, SW NE SE 31-16n-56e, is one of the most important to be drilled in the basin and Range Province of western Utah and Central Nevada. It has as objective the Eureka sandstone at around 7,500 ft. and is now reported drilling below 3,600 ft. The well is a tight hole, with no reports of formation test or tops, but it is reported in Eli, Nev., that some slight shows have been encountered. It is not believed that shows of commercial size have been found, however.

WYOMING WILDCAT FAILURES

Goshen Hole, Goshen County: C. W. Teater 1 Blunt, SE NE NE 32-22n-63w, 8,230 ft. TD; dry; Niobrara 7,100 ft., Timpas 7,420 ft., Codell 7,445 ft., Muddy 8,212-27 ft.

Wallace Creek, Natrona County: Bay Petroleum-Superior Oil Co. 1 Unit, SE SW NE 15-34n-87w, 10,790 ft. TD; dry, Base Lance 3,158 ft., Mesaverde 3,858 ft., Steele 4,712 ft., Shannon 7,190 ft., Base Niobrara 9,223 ft., first Frontier 9,536 ft., second Frontier 9,704 ft., third Frontier 9,810 ft., fourth Frontier 9,976 ft., Mowry 10,189 ft., Thermopolis 10,484 ft., Muddy 10,524 ft., Dakota 10,655 ft., Fuson 10,709 ft., Lakota 10,725 ft., Morrison 10,773 ft.

COLORADO WILDCAT FAILURES

Red Mesa, La Plata County: Hathaway Co. 1 Hall, SE NE NW, 22-33n-12w, 3,537 ft. TD; dry; Dakota 3,300 ft., Morrison 3,380 ft.

Woodrow, Washington County: Adams Drilling Co.-Woodrow Oil 1 fee, SW SW NW 9-2s-55w, 5,332 ft. TD; dry, Niobrara 4,035 ft., Timpas 4,415 ft., Muddy 4,88 ft., Dakota 4,964 ft., Fuson 5,045 ft., Lakota 5,180 ft.

MONTANA WILDCAT FAILURES

Hardin area, Big Horn County: Glenn H. McCarthy 1 Kendrick, C NW¼, 28-1n-35e, 8,554 ft. TD; dry, Bearpaw 592 ft., Judith River 1,576 ft., Eagle 2,446 ft., Virgelle 2,613 ft., Colorado 2,708 ft., Dakota Transition 4,790 ft., Dakota 4,930 ft., Fuson 5,020 ft., Morrison 5,083 ft., Ellis 5,388 ft., Reirdon 5,548 ft., Piper 5,747 ft., Chugwater 5,962 ft., Phosphoria 6,098 ft., Tensleep 6,180 ft., Amsden 6,326 ft., Lower Amsden 6,457 ft., Charles 6,565 ft., Mission Canyon 7,042 ft., Lodgepole 7,523 ft., Devonian 8,070 ft., Ordovician 8,301 ft., Upper Red sand 8,324 ft., Lower Red River 8,355 ft., Cambrian 8,375 ft.

Hay Creek area, Carter County: Amerada Petroleum Corp. 1 Washburn, CNW NE 31-5s-57e, 6,462 ft. TD; dry; Newcastle 2,306 ft., Skull Creek 2,385 ft., Dakota 2,664 ft., Morrison 2,932 ft., Ellis 3,150 ft., Gypsum Springs 3,606 ft., Spearfish 3,752 ft., Minnekahta 4,163 ft., Opeche 4,215 ft., Charled 4,758 ft., Mission Canyon 5,085 ft., Lodgepole 5,450 ft., Englewood 5,791 ft., Siluro Devonian 5,835 ft., Ordovician 6,040 ft., Big Horn 6,080 ft.

Wolf Creek: Arnold Smith 1 O. Anderson, CNE NE 11-21n-16e, suspended indefinitely.

MONTANA SUCCESSFUL WILDCAT

Cedar Creek, Fallon County: Husky Oil Co. 1 NPRR, CNE NE 7-41n-62e, 6,834 ft. TD; pumped average 100 bbl. fluid per day, 10 per cent oil; Niobrara 2,606 ft., Greenhorn 2,650 ft., Graneros 2,860 ft., Muddy 3,438 ft., Skull Creek 3,490 ft., Dakota Silt 3,760 ft., Dakota Sand 3,830 ft., Morrison 3,960 ft., Sundance 4,030 ft., Spearfish 4,622 ft., Salt 5,055 ft., Minekahta 5,490 ft., Opeche 5,540 ft., Minnelusa 5,660 ft., Big Snowy 6,000, Charles (?) 6,370 ft., Madison 6,817 ft.

NEBRASKA SUCCESSFUL WILDCAT

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Warren-Ginther et al 1 Dorman, SE SW NE 23-14n-50w, 4,696 ft. TD; pumped 352 bbl. oil per day; Niobrara 3,840 ft., Fort Hayes 4,130 ft., Codell 4,223 ft., Greenhorn 4,387 ft., "D" Sand 4,658 ft., "G" Sand 4,688 ft.

NEBRASKA WILDCAT FAILURE

S. E. Alliance, Garden County, Stanolind Oil & Gas Co. 1 F. L. Ferrell, SE NE NE 10-19n-43w, 3,755 ft. TD; dry; Pierre 1,184 ft., Niobrara 2,460 ft., Carlye 2,860 ft., Greenhorn 2,987 ft., Graneros 3,028 ft., Cloverly 3,558 ft.

Texas Gulf Coast

New Oiler Completed Near Hilje for 172 Bbl.

HOUSTON.—A new oil discovery has been completed 3 miles southeast of Hilje in Wharton County. Commercial Petroleum & Transport Co. 1 John Kulcak flowed 172 bbl. of 41°-gravity oil through 8/64-in. choke on potential test. Operators drilled the well to a depth of 6,796 ft. and set 5½-in. casing at total depth. Production is through perforations at 6,562-68 ft. This new oil discovery is located in the ET RR Co. Survey 57, Abstract 122.

G. S. Hammonds 1 Walter Schneider, wildcat 5 miles northeast of Cat Springs, Austin County, has been completed in the upper sand through perforations at 10,057-72 ft. and is now waiting on potential test. On an earlier test of the same perforations, the well flowed an estimated 99 bbl. of 43.8°-gravity oil in 20 hours through ⅛-in. and ¼-in. adjustable chokes with 880 psi. working pressure.

Continental Oil Co. has completed 1 Georgia Jones for a small oil discovery 10 miles northwest of Flatonia in Fayette County. On 24-hour potential, the well pumped 24 bbl. of 20.2°-gravity oil through open hole at 2,151-72 ft. Location is in the J. S. Menefee Survey, Abstract 239.

Four miles southeast of Hoskins Mound Dome, in Bastrop Bay, Brazoria County, Amerada Petroleum Corp. has completed C-1 State Lease 34,316 for a new oil discovery. On a 24-hour test through perforations at 7,122-36 ft., the well flowed 50 bbl. of 36.6°-gravity oil daily through a 12/64-in. stroke. Tubing pressure was 2,450 psi. Gas flow was 1,834,600 cu. ft. daily.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Chambers County: New pay at Oyster Bayou—Sun Oil Co. 31 Felix Jackson, T&NO Sur. 124, TD 10,200 ft., top pay 8,408 ft., perf. 8,408-21 ft., IP: 38,000,000 cu. ft. of gas per day, open flow, SITP 3,135 psi.

Victoria County: New pay at Heyser—Gulf Oil Corp. B-57 T. P. Traylor, Jose Esteban Galban Sur., A-34, top pay 6,142 ft., TD 8,000 ft., perf. 6,142-53 ft., IP: 152 bbl. oil per day, 11/64-in. choke, GOR 814, TP 650 psi., 42° gravity.

Wharton County: New oil pool—Commercial Petroleum & Transport Co. 1 John Kulcak, ET RR Sur. 57, A-122, 3 mi. SE of Hillje, TD 6,796 ft., top pay 6,562 ft., pef. 6,562-68 ft., IP: 172 bbl. oil per day, 8/64-in. choke, TP 925 psi. 41° gravity.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Brazoria County: Dillar-Waltermire, Inc., 1 J. O. Webb, et al, Wm. McDermott Lg. 341, 9 mi. SE of Angleton, dry, TD 11,542 ft.

Lee County: Nails Creek Oil Co. 1 Seymour Sacks, Thos. S. Hinds Lg., 8 mi. NE of Giddings, dry, TD 5,003 ft.

Polk County: Dr. S. H. Bergman et al 4 Ernest Coker, John T. Pinckney, A-63, 2½ mi. N of Goodrich, dry, TD 3,150 ft.

Waller County: Superior Oil Co. 2 Guy F.

Pattison, et al, J. McFarland Sur., A-46, near Brookshire Dome, dry, TD 9,000 ft.
Wharton County: Sohio Petroleum Co. 1 Schwartz & Davis, D. D. D. Baker Sur., 3 mi. NE of Lane City, dry, TD 7,220 ft.

Canadian Fields

Central Alberta Wildcat Has Encouraging Shows

CALGARY.—Oil encouragement was obtained this week at a Central Alberta wildcat in the Lisburn area, about 50 miles northwest of Edmonton. The well, Texaco & General Petroleums 1-22, in LSD 1, 22-56-6w5, ran a 1-hour drill-stem test in the Viking sand interval 3,867 to 3,887 ft., and received a natural-gas flow rate of 231,000 cu. ft. daily. When tester was pulled, pipe recovery consisted of 370 ft. of gassified oil with no water.

Production string of 7-in. casing has been set and crew is now installing a pump on the well, in efforts to determine the oil potentialities of the strike. The well is owned by Texaco Exploration Co., McColl-Frontenac Oil Co., General Petroleum of Canada, Ltd., Superior Oils, Ltd., Kroy Oils, Ltd., Jupiter Oils, Ltd., and Spooner Oils, Ltd.

The Redwater Leaseholds group ran another drill-stem test at its 6 Campbell; the result was a substantial recovery of crude oil. The latest test, run in the third and deepest productive zone of the Lower Cretaceous sands, was of the interval 3,741-61 ft. During the 1-hour test maximum natural-gas flow rate was 80,000 cu. ft. daily, while pipe recovery consisted of 1,800 ft. of oil.

Redwater Leaseholds-Campbell 6, in LSD 12, 27-54-25w4, has found oil and natural gas in three sections of the Lower Cretaceous. The 6 well is the first well in the Campbell area, about 11 miles northwest of Edmonton, to find oil in three sections of the Cretaceous, and is the first to find the mid-section productive. The hole is being completed at 3,786 ft., and now has production string of casing set.

Imperial Oil, Ltd.'s Stony Plain wildcat has found some oil in the top of D3 Devonian zone, but the indicated pay section is thin and is underlain by salt water. The presence of D3 coral reef and oil offers encouragement, but it is doubtful whether the present well will result in a commercial producer.

Official drill-stem-test results released by Imperial on the 1 Stony Plain are as follows: 95-minute test of interval 5,005-5,137 ft. gave recovery of 3,780 ft. of gas-cut mud and oil; 630 ft. of gas-cut mud, oil and salt water (with one-third of fluid being salt water); 90 ft. of gas-cut oil and salt water (with one-half of fluid being salt water); and 90 ft. of gas-cut salt water. The oil was 37.6° gravity.

Hole was cored a further 5 ft., and drill-stem test was run of interval 5,134-42 ft. A 46-minute test resulted in pipe recovery of 3,400 ft. of salt water with no oil. Drilling is now being resumed, and will likely be carried at least to the fragmental lime underlying D3 zone.

Imperial-Stony Plain 1, in LSD 8, 21-52-26w4, is located a few miles north of the Leduc-Woodbend Devonian oil field. Before reaching D3 zone the well encountered natural gas in varying volumes in three zones, had a showing of oil in the Cretaceous, and some encouragement in a tight D2 zone. These various sections will likely be tested before the well is chalked up as a completion.

Twenty-one wells were completed in Alberta during the past week, including 16 oil wells, 2 gas wells, and 3 which failed to find either oil or natural-gas production. Total well completions for the province during the 209-day period from January 1 to June 28 this year now stands at 496.

Ten of this week's completions were drilled in the Redwater area. Nine resulted in oil production, while the other was dry. Imperial Oil, Ltd., accounted for six of the producers; Federated & General Petroleums group placed another two oil wells on production; and Pacific group successfully completed another field well. The lone failure was drilled by Piccadilly Petroleums, about 1¾ miles southeast of Redwater production.

In the Leduc-Woodbend area, four more oil wells were placed on production and two were abandoned. Imperial drilled three of the successful completions and Marjack Oils, Ltd., drilled the other. The team of Hammil, Henderson & Anaconda failed at their venture in the southern sector of Leduc; Alanna Petroleums also got a dry hole at their exploratory test located about 4½ miles southwest of Leduc oil.

Another two Joseph Lake oil wells were placed on production by Superior-General-Kroy-Jupiter-Imperial group, and the remaining oil well completion this week was drilled in the Excelsior oil field, by Imperial.

The two gas wells completed were both drilled in proven natural-gas areas. One, in Central Alberta's huge Viking-Kinsella gas field, was drilled by Northwestern Utilities, Ltd.; and the other, in the Medicine Hat area of southern Alberta, was drilled by the city of Medicine Hat.

EASTERN CANADA

In Huron County, Ontario, Ailstan Prospecting Syndicate is drilling for oil and gas on the Schenk farm 1½ miles north of Crediton, testing a potential structure extending through Hay and Stephen townships. Preliminary work was done by S. M. Julian of London and Wm. Ostreicher of Crediton. H. Evans & Sons of Tillsonburg are handling the drilling contract. At 1,132 ft., the drill encountered a salt deposit which continued for about 250 ft. Drilling is continuing to test the lower formations.

Mississippi

Texaco Test Shows Oil On Top of Gas Rock

JACKSON.—Approximately 7 miles north of Jackson, The Texas Co. 1 J. M. Hartfield, 35-8n-1e, Madison County, had slight shows of oil in top part of the Gas Rock. Three cores were taken from 3,869-95 ft. which were reported as lime with slight show of oil. Four more cores were cut from 3,895-928 ft. with recovery being reported as lime and chalk, with no show. A drill-stem test was run from 3,862-928 ft. using ¼-in. top and ⅜-in. bottom chokes. Tool was left open 30 minutes and recovery was 60 ft. of mud and 500 ft. of salt water. Top pressure was 1¼ psi. Operators were drilling ahead below 4,112 ft. in the wildcat at last report.

Lion Oil Co. is encountering difficulty in bringing in its 1 M. E. Allred, NW SW 23-6n-6e, south offset to the discovery well for the West Lincoln field, Lincoln County. Perforations have been squeezed twice and the well has been perforated the third time. On latest test, the well was swabbed and then shut in over night. Swab was then run twice and the well kicked off and flowed for 45 minutes and then died. Following this, the well swabbed an unestimated amount of fluid which was 60 per cent oil and 40 per cent salt water. Operators are now preparing to install pump.

In Wayne County, approximately 7 miles east and 1 mile north of Waynesboro, Southeastern Drilling Co., et al, 1 N. V. McRae, NW NE NW 5-8n-5w, cored salt water sand in the Lower Tuscaloosa and at last report was drilling ahead below 6,121 ft. No recovery was obtained in core taken

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at 5,920-25 ft. Recovery from core at 5,925-30 ft. was salt water sand.

MISSISSIPPI WILDCAT FAILURES

Adams County: Kemp Drilling Co., et al, 1 Byrnes & McDowell, 27-7n-3w, dry, TD 7,012 ft.

Franklin County: R. A. Campbell 1 U. S. A., 21-6n-2e, dry, TD 11,020 ft.

ALABAMA WILDCAT FAILURE

Mobile County: Smith County Oil Co. 1 Odom, 24-2n-3w, dry, TD 7,536 ft.

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North Central Texas

Bend Test in Stonewall County Finaled for 964 Bbl.

WICHITA FALLS.—Stonewall County's second Bend conglomerate discovery, Roark & Hooker and A. G. Hill 1 C. L. Williams, Section 6-C-AB&M Survey, 8 miles northeast of Aspermont, completed for a calculated daily flowing potential of 964 bbl. of 40°-gravity oil a day. This was based on actual 20-hour flow of 803.75 bbl. of oil through 32/64-in. choke, from open hole at 5,860-74 ft. Flowing pressures were 500 psi. on casing and 275 psi. on tubing. Top of the formation was 5,858 ft. Location is 3 miles southeast of the county's previous conglomerate field opener at C. L. Norsworthy, Jr. 1 C. D. Wiley, in 44-G-Alice Stephenson Survey.

Deep Rock Oil Corp. was rigging up rotary at its 1 C. B. Long, 6,700-ft. conglomerate wildcat, 660 ft. out of the northeast corner of Section 2, Block H, F. T. Oliver Survey, A-1765. Location is 6 miles northwest of the 1 Wiley, and 2¼ miles northwest of 1 Turner, a dry hole at 5,242 ft.

In Knox County, 3 miles southeast of Munday, Texas Pacific Coal & Oil Co. completed its 1-A Louis Cartwright as a Strawn sand discovery. On potential test the well pumped 205 bbl. of 34°-gravity oil a day. Total depth was 6,047 ft., plugged back to 4,588 ft.

Fowler Farm Oil Corp. staked location for a 2,000-ft. semiwildcat 3 miles southwest of Goree, as the 1 R. L. Ratliff, 1,891 ft. from south and 3,939 ft. from west lines, Robert Wilkins Survey, A-411. Location is about 1,320 ft. southeast of Frank Wood's 2 Maloney which was testing an oil sand at 1,677-80 ft., and estimated good for 20 bbl. of oil a day. It is also about 2 miles northeast of the Texas Pacific discovery.

In Montague County, Houston Bowers staked location for a semiwildcat 9 miles north of Bonita and ½ mile northwest of Harvey Drilling Co.'s Howard & Wine producer. The new operation is the 1 Eddie Howard, Block 82, Kaufman County School Lands Survey. Projected depth was 3,075 ft.

Mid-Continent Petroleum Corp. 1 W. G. Embry, E. Wingate Survey, A-835, 5 miles southeast of Montague, and 3,000 ft. southeast of the Kennedy Caddo field, was to be put on the pump after swabbing 225 bbl. of oil in 24 hours. Production was from casing perforations at 6,150-56 and 6,162-74 ft.

NORTH TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Clay County: J. B. Stoddard 1 E. D. Coleman, Sec. 3,225, TE&L Sur., ¾ mi. S Buffalo Springs, TD 6,594 ft., UB 5,747 ft., elev. 1,078 ft., top Caddo 5,690 ft., pay 5,704 ft., perf. 180 shots 5,704-34 ft., flowed 92.8 bbl. of 49°-gravity oil a day, ½-in. choke, GOR 1,864 cu. ft., TP 40 psi.

Coleman County: Haynes B. Owenby Drilling Co. 1 C. A. Billings, Sec. 7, HT&B Sur., 1½ mi. SW Silver Valley, TD 3,646 ft., elev. 2,115 ft., pay 3,592 ft., flowed 98 bbl. of 41°-gravity oil a day, 10/64-in. choke, GOR 500 cu. ft., CP 500 psi., TP 150 psi., perf. 48 shots, 3,578-92 ft., 3,592-3,646 ft.

Comanche County: Deep Well Oil Corp. 1 F. B. Porter, Sec. 17, D&DA Sur., 3½ mi. SSW Gorman, TD 3,063 ft., elev. 1,320 ft., pay 2,664 ft., perf. 2,664-94 ft., pumped 15 bbl. of 37°-gravity oil a day, Ellenburger 3,029 ft.

Eastland County: Bankline Oil Co. 3 Briggs Owen, 48-4-H&TC, 5½ mi. NE Cisco,

(Continued on page 115)

Appalachian Field

Hope Natural Gas Co. Stakes New Location

PITTSBURGH.—In Portland district, Preston County, West Virginia, Hope Natural Gas Co. has located the 9462 Margaret C. Kraus, elevation 2,012 ft., in the vicinity of Terra Alta. It is on the Kingwood Quadrangle, .40 mile south of Latitude 39°, 25′ and 4.40 miles west of Longitude 79°, 30′. In Steele district, Wood County, Godfrey L. Cabot, Inc. 1320 J. H. Brown had Corniferous lime at 4,850 ft. and Oriskany sand at 4,976-5,021 ft. It will be shot. The well has reached a depth of 5,024 ft.

In Triadelphia district, Logan County, United Producing Co., Inc., 97-1679 W. M. Ritter Lumber Co. was completed in the Berea sand, gaging 1,050,000 cu. ft. of gas, after shot; total depth was 4,116 ft. In Pocatalico district, Putnam County, C. L. Samples 1-1 L. A. Landers et al resulted in 2,150,000 cu. ft. of gas. The following tops yere reported: Corniferous lime 4,923 ft., Oriskany sand 5,018 ft., gas 5,018-32 ft. Total depth was 5,037 ft.

In Unity Township, Westmoreland County, southwestern Pennsylvania, Peoples Natural Gas Co. 1-3921 Fred Musnug, elevation 2,100 ft., is drilling at 3,930 ft. In Georges Township, Fayette County, Orville Eberly et al 1 N. E. Murphy, elevation 2,560 ft., is shut down at a depth of 7,850 ft. for rig repairs.

In northern Pennsylvania, Coganhouse Township, Lycoming County, Godfrey L. Cabot, Inc. has made location for the 1 E. E. Hughes, a rank wildcat. In the Leidy area, Chapman Township, Clinton County, Shaw & Smith 1 Frank Harman, elevation 635 ft., is drilling at 5,860 ft. This well had a flow of gas estimated at 700,000 cu. ft. at 1,238-51 ft. The Tully lime was topped at 5,415 ft.

In Garrett County, Maryland, Fox & Trimble 1 Edward Kite is shut down at 4,927 ft., 102 ft. in the Oriskany sand which was topped at 4,825 ft. with no show of gas. The 5½-in. casing was run at 4,836 ft.

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Permian Basin

Howard Discovery Finaled For 1,212 Bbl. Daily

MIDLAND.—George R. Brown 1 Lloyd Branon and others, 18-27-H&TC, discovery 1¾ miles south and slightly west of the East Vealmoor field of Howard County, completed for a daily potential of 1,212 bbl. of oil a day from Pennsylvanian limestone at 7,325-86 ft. Potential was based on an actual 8-hour flow through ⅜-in. choke. Gas-oil ratio was 1,135 cu. ft. and oil was 45° gravity. Pan American Pipe Line Co. was reported laying a 6-in. pipe line from the North Vincent area to the new well.

Between the two Vealmoor fields, Castleman & O'Neill 1 L. D. Rodgers, NW SE 29-31-T3N-T&P, reported top of the Canyon lime at 7,682 ft., or minus 5,208 ft. Drill samples had a fair show of oil to 7,702 ft.

Four miles east of the 1 Rodgers, Sunray Oil Corp. 4 Wilson, SW NE 36-31-T3N-T&P, was drilling ahead following recovery of 16 ft. of drilling mud on a 45-minute drill-stem test of the Canyon section from 7,613-57 ft. Top of the reef had been called at 7,630 ft., or minus 5,168 ft.

Rutherford-Heep 1 John Gilmer Davis, 68-25-H&TC, 2½ miles southwest of the Von Roeder field, continued to test the reef. Casing had been set at 6,766 ft., and total depth was 6,781 ft. With 2-in. tubing at 6,758 ft., the well flowed 199 bbl. of oil in 24 hours, through 3/16-in. choke, under casing pressure of 800 psi. Following that it gaged 204 bbl. of oil in 24 hours through the same size choke.

Amerada Petroleum Corp. was building roads and drilling a water well for a north offset to the Rutherford-Heep discovery, which was designated the 1 W. Ed Murphy, SE SE of Section 81. Proposed depth was 7,500 ft.

In northwest Howard County, Shell Oil Co. 1 O'Daniel, SE SW 2-30-1N-T&P, 7 miles northeast of Coahoma, had only light shows of gas in the Ellenburger, plus salty, sulfur water. The above was on a drill-stem test at 8,729-80 ft., which was open 2 hours. Recovery was 450 ft. of slightly gas-cut sulfur water, and 2,500 ft. of salty, sulfur water, with no shows of oil.

Operators were running electrical surveys, after which it was to be plugged back to around 8,010 ft., set casing and test a thin Pennsylvanian limestone section between 7,980-8,010 ft., where a drill-stem test flowed 37 bbl. of 47°-gravity oil in 40 minutes, then unloaded oil from the drill pipe.

Magnolia Petroleum Co. 1 W. W. Caswell, NE SW 431-9-EL&RR, Lynn County, west offset to its 1 Garza Land & Cattle Co. Pennsylvanian discovery of the O'Donnell field, reported a good show of oil in the Spraberry sand of the lower Permian. A drill-stem test at 5,960-6,071 ft., using ⅝-in. bottom and 1-in. top chokes, recovered 180 ft. of heavily mud-cut oil, and 270 ft. of heavily gas-cut mud, with no oil. Open flowing bottom-hole pressure ranged from 175-490 psi., and 20-minute shut-in pressure was 1,760 psi. Top of the Spraberry was 5,943 ft., or minus 3,023 ft., which was 28 ft. low to the same marker in the discovery. The discovery well was completed for 245 bbl. of oil a day in the Pennsylvanian at 8,615-30 ft., in May of this year.

In eastern Irion County, 6 miles east of Mertzon, Wilshire Oil Co. and Balboa Oil Co. 1 Lawrence D. Brooks, NW NW 21-3-H&TC, was showing for gas-distillate production, from a sand tentatively identified as the Fry sand of the Pennsylvanian.

On a drill-stem test from 5,955-75 ft., gas came to the surface in 50 minutes and held a strong blow throughout the 2-hour test. Gas volume was estimated at 100,000 cu. ft. daily at the start and 200,000 cu. ft. at the end of the test. Distillate sprayed out with the gas, which was estimated at 10 gal. per 1,000 cu. ft. of gas. Recovery in the pipe was 200 ft. of heavily gas and distillate-cut mud. Flowing bottom-hole pressure was 150 psi. and 15-minute shut-in pressure was 3,000 psi. Operators cored ahead and were preparing another test from 5,975-6,015 ft.

Ted Weiner and associates were reported to have taken over Spartan Drilling Co. and others' 1 Wolcott, Ellenburger failure in northwest Martin County, and were to attempt to complete as a Spraberry discovery.

The well was drilled to 12,798 ft., in the Ellenburger topped at 12,570 ft., or minus 9,677 ft. That formation tested sulfur water from 12,680-798 ft., with no shows of oil or gas. At last report the well had been plugged back to around 8,200 ft., with 7-in. casing set at 7,900 ft. Testing was to be in open hole below the casing. Location is 5,864 ft. from west and 1,471 ft. from north lines, League 251, Ward County School Lands, 13 miles northwest of Lenorah.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCAT

Coke County: Union Oil Co. of California 1-B Daisy McCutcheon, SW NW 445-1A-H&TC, 5 mi. E Robert Lee, 1 mi. E 1 Jim McCutcheon, dry hole at 6,746 ft.; TD 6,685 ft., PB 4,000 ft., elev. 1,940 ft., top upper Cisco sand pay 3,950 ft., perf. 90 shots 3,952-65 ft., IP: flowed 179 bbl. 42.6°-gravity oil a day, ¼-in. choke, GOR 300 cu. ft., TP 120 psi., Ellenburger top by samples 6,295 ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Borden County: Aurora Gasoline Co. 1 C. J. Engle, SW NW 64-25-H&TC, 2¼ mi. NW nearest North Vincent field outpost producer, dry, TD 7,313 ft., elev. 2,316 ft., reef 7,290 ft. by samples.

Crockett County: Jack Holt 3 C. J. Fuller,

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4-A3-D. Savage Sur., 2½ mi. NE Vaughn field, dry, TD 1,508 ft.

Dickens County: Placid Oil Co. 1 S. W. Hughes, 3 mi. SW Spur, dry, TD 7,950 ft., elev. 2,311 ft., Glorietta 2,170 ft., Clear Fork 2,340 ft., Waddell 4,800 ft., Strawn lime 6,983 ft., Mississippian 7,540 ft., Ellenburger 7,860 ft., pre-Cambrian 7,936 ft.

Gaines County: The Texas Co. 1 T. S. Riley, NW NW 415-G-CCSD&RGNG, 1¼ mi. NE Russell field, dry, TD 7,412 ft.,

(Continued on page 120)

Illinois-Ind.-Ky.

Knox County Wildcat Shows for Production

H & V OIL CO. and Tippecanoe Oil Co. appear to be opening another producing area in the Monroe City area of Knox County where their 1 Kensler-Dreiman, Militia Donation 40-3n-9w, is testing Aux Vases sand, logged at 1,466-70 ft. The well, located 3 miles west of the town of Monroe City and old abandoned shallow production in that area, had a 700-ft. oil fill-up after drilling out plug, and then swabbed at the rate of 2½ bbl. of oil per hour. Hole is open below 1,449 ft.

About a mile south of the East Reed pool, near the town of Reed, eastern Henderson County, western Kentucky, Kingwood Oil Co. 1 Krohwinkel, SW NE NW 25-Q-27, got a good showing of gas and yielded 157 ft. of clean oil and 180 ft. of oil-cut mud in a drill-stem test in Rosiclare lime at 1,889-95 ft. Tester was open 2 hours. Bottom of the hole is 2,013 ft. with 5½-in. casing run to the top of the pay. The Reed East pool, opened during 1949 by Kingwood Oil Co., produces from the Waltersburg sand.

Delta Drilling Co. and associates found good showings of oil in Tar Springs sand in their 1 Townsend, SW SE SW 20-N-22, a wildcat in the area west of Wanamaker and southwest of Poole, in Webster County, Kentucky. A drill-stem test, taking in an interval at 1,900-13 ft., got 90 ft. of oil and 60 ft. of oil-cut mud in the pipe with the tester open 60 minutes. At its total depth, the well still was in the sand. Casing has been run to the top for completion.

Testing is under way at Robinson & Puckett Drilling Co. 1 Coal Consolidated, located east of production of the North Samsville pool, 3 miles northeast of Albion, in the NE NW SE 20-1s-14w, Edwards County, Illinois. The well was drilled as a "tight" hole and no information is available from the operators, but it is reported to have flowed clean oil during a 45-minute drill-stem test in Rosiclare lime. Total depth is given as 3,048 ft.

Arnold Valter 1 Drone, NE NE NE 27-8s-9e, 3 miles east of Ridgway, Gallatin County, Illinois, is being put on the pump after swabbing initially at the rate of 10 bbl. of oil per hour. Pay zone, shot with 40 qt. in the Cypress sand, logged at 2,474-94 ft. Location is about a mile southeast of the Inman pool, nearest production.

Recent discovery of production in the Rosiclare lime in the old Noble area, 4 miles west of Olney, Richland County, Illinois, is being confirmed by a west offset to the initial well. The offset, C. G. Davis and Perry Fulk 1 Balding, SW NE NW 11-3n-9e, flowed clean oil during a drill-stem test of that pay zone, logged at 2,955-70 ft., and has run oil string to 2,950 ft. for completion. Bottom of the hole is 2,974 ft. The discovery well, Skiles Oil Corp. 1 Watkins heirs, SE NE NW 11-3n-9e, had the pay at 2,954-65 ft. and flowed at the rate of 21 bbl. of oil per hour while testing. Pumping equipment is being installed.

Location of these wells is in the area where first Salem lime production for the pool was opened late in June. Proving up of the two new zones is creating an active development program in the vicinity. The Salem pay, opened by Perry Fulk, is found at depths of 3,500 to 3,600 ft.

ILLINOIS WILDCAT FAILURES

Coles County: J. G. Pulliam 1-A Cashat, SE NE SE 24-12n-8e, dry, TD 2,290 ft.

Hamilton County: Aurora Gasoline Co. et al., 1 Howard, NW NE SW 9-7s-6e, dry, TD 3,356 ft.

Madison County: A. R. Frank 1 Johnson, C W½ NW NW 29-6n-9w, dry, TD 937 ft.

Pike County: C. Measley 1 Nichols, NW NW SW 12-3s-2w, 4th P.M., dry, TD 715 ft.

Wayne County: Yingling Oil Co. 1 Lawrence NW NE SE 35-1s-5e, dry, TD 3,160 ft.

INDIANA SUCCESSFUL WILDCAT

Pike County: Ryan & Sharp 2 Enos Coal, SW SE SE 4-3s-8w, IP 102 bbl., Cypress 1,372-79 ft., TD 1,379 ft. (Opens Clay Bank pool.)

INDIANA WILDCAT FAILURES

Clay County: Carter Oil Co. 1 Wells, NW SW SW 6-13n-6w, dry, TD 1,289 ft.

Daviess County: Eidson & Gwaltney 1 Barber, SW NW NE 35-2n-7w, dry, TD 1,578 ft.

Gibson County: Ryan & Sharp 1 Garrett, NW NW SE 35-2s-13w, dry, TD 2,789 ft.

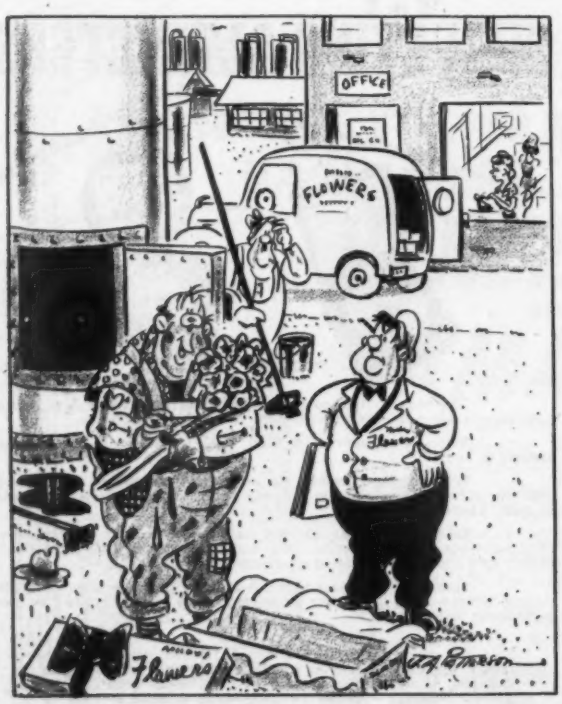
Greene County: National Associated Petroleum Co. 1 Shake, NW NW SE 34-6n-7w, dry, TD 2,840 ft.

Parke County: Carter Oil Co. 1 Brocius, NW NE NW NE 10-14n-6w, dry, TD 1,213 ft.

Carter Oil Co. 1 Seip, SW SW SW NW 7-15n-6w, dry, TD 1,189 ft.

Posey County: George S. Engle 1 Strupp, NW NW NW 31-5s-12w, dry, TD 2,856 ft.

Skiles Oil Corp. 1 Ford, SE SW NW 14-5s-13w, dry, TD 3,039 ft.



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WESTERN KENTUCKY SUCCESSFUL WILDCAT

Ohio County: R. A. Fawcett 1 Westerfield, SE NE SE NE 16-N-32, IP 3 bbl.,
(Continued on page 119)

Michigan

Traverse Discovery Continues Tests

MOUNT PLEASANT.—After tubing had been set at Franklin T. Rand and C. W. Collin 1 Albar, NW NW NW 20-14n-4w, Union Township Traverse oil discovery well in Isabella County, the well flowed at the rate of 4 bbl. an hour through a restricted choke. It was acidized earlier with 250 gal., and the first 2 hours after treatment, production totaled 32 bbl. of net oil. On another flow test, through a restricted choke, the well flowed from 8 to 17 bbl. an hour. Production has been pinched back to an average of 4 or 5 bbl. an hour for further tests. No water is showing.

Traverse lime was logged at 3,118 ft. and the hole is bottomed out at 3,195 ft., 2 ft. in the pay. The general consensus of opinion appears to be that Rand and Collins have tapped a Traverse coral reef pay which had not been present in any of the surrounding control wells. At last report, no offsets had been announced.

In Wise Township, Isabella County, Union Development Co. was reacidizing at the 1 Rank, SE SE SW 13-16n-3w, where a potential Dundee oil pay had been logged. This wildcat has averaged about 30 bbl. of oil a day since the first acid shot with 1,000 gal. Union ordered 3,000 gal. for the second treatment. Dundee was topped at 3,744 ft., and the hole was drilled to 3,796 ft., total depth. It carried from 300 to 400 ft. of free oil, natural. The company will start additional drilling in this area immediately.

A Berea gas field appeared to be assured in Cedar Creek Township, Muskegon County, as Charles D. Hoffman and Clark R. Peoples gaged 2,100,000 cu. ft. of gas from this zone at their 1 Austin, SE NE NE 19-11n-15w. This is the second well producing gas from the Berea in this area and the 1 Austin is located about ½ mile northeast of same operator's discovery well. Berea was logged at 1,098 ft. Drilling was halted at 1,107 ft., total depth. The gas will be sold to Campbell, Wyatt & Cannon, a Muskegon foundry, and this company will start construction of a 7-mile, 4-in. pipe line from the area to Muskegon immediately.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: George F. Lister 1 Skinner, SE NE NE 32-1n-16w, Traverse 1,114 ft., dry, TD 1,141 ft.

Clyde Township: Ford Oil Co. 1 Drew, NE NE SE 30-2n-15w, dry in Coldwater red rock, TD 555 ft.

Lee Township: Del Fortney 1 Lasharr, SE SW SE 16-1n-15w, Traverse 1,201 ft., dry, TD 1,243 ft.

Lake County: Cherry Valley Township: Oil Producers, Inc., 1 Woods, NW SW NW 24-18n-12w, Traverse 2,880 ft., dry, TD 2,895 ft.

South Newkirk: Louis Rose 1 Slocktoski, NW NW NE 23-19n-12w, Monroe 3,306 ft., dry, TD 3,412 ft.

Mason County, Riverton Township: Mercer Oil Co., Inc., 1 Futtrell, NW NW NE 33-17n-17w, Monroe 2,207 ft., dry, TD 2,275 ft.

Midland County, Larkin Township: Fisher-McCall Oil & Gas., Inc., 1 McKay, NW SW NW 21-15n-2e, Dundeed 3,683 ft., dry, TD 3,874 ft.

Oceana County, Benona Township: R. W. Devine and J. W. Lang Co. 1 Neuman, SE SW SW 21-14n-18w, Traverse 1,684 ft., dry, TD 1,715 ft.

Van Buren County, Bloomingdale Township: W. C. Vandenberg, Jr., 1 Crummer-Carnes, Stout, NE NW NW 4-1s-14w, Traverse 1,302 ft., dry, TD 1,431 ft.

Chester Anderson 1 Powers, SE NW NE 9-1s-14w, Traverse 1,292 ft., dry, TD 1,305 ft.

Ohio Fields

Summit County Test Finds Newburg Gas

COLUMBUS.—Ed Obermiiier et al., found gas in the Newburg sand in a wildcat test on Carlos Workman, Lot 81, Bath Township, Summit County. The sand was topped at 3,215 ft. and drilled to 3,235 ft. where the gage was 215,000 cu. ft. with 1,230 psi. The well was shut in natural.

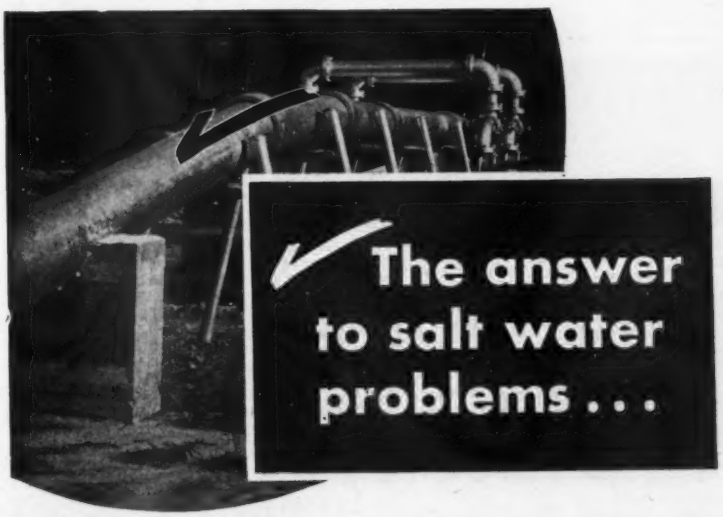
Willard Shrider et al., moved 1,000 ft. north for the 2 E. Van Winkle, Section 8, Jackson Township, Knox County, and found the Clinton at 2,894-2,915 ft. with a showing of oil and 400,000 cu. ft. of gas. In 24 hours after shot, the well made 15 bbl. and gaged 500,000 cu. ft. of gas.

Foraker Drilling Co. moved a location east of the old pool in the center part of Bowling Green Township, Licking County, and struck 600,000 cu. ft. of gas, natural. The Clinton was found at 2,793-2,821 ft. and rocked to 850 psi. in 24 hours.

Mid East Oil Co. finished another nice well on 10 R. E. Beard, Section 32, Madison Township, Perry County. The Clinton at 3,194-3,232 ft. showed 1,000 ft. of oil in 15 hours, natural, and 50 bbl. in 24 hours after shot.

OHIO SUCCESSFUL WILDCAT

Summit County, Bath Township: Ed Obermiller et al., 1 Carlos Workman, Lot 81, 213,000 cu. ft. of gas from the Newburg, TD 3,235 ft.



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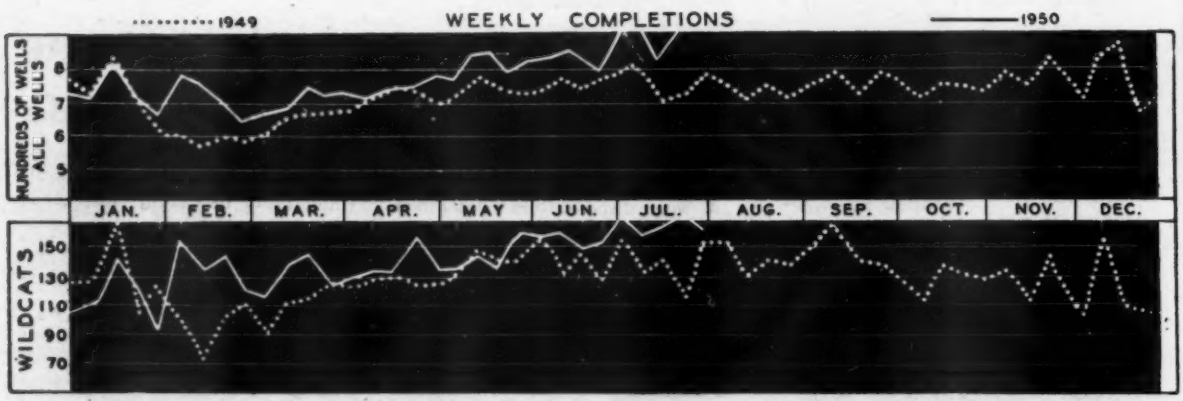
CURRENT STATISTICS

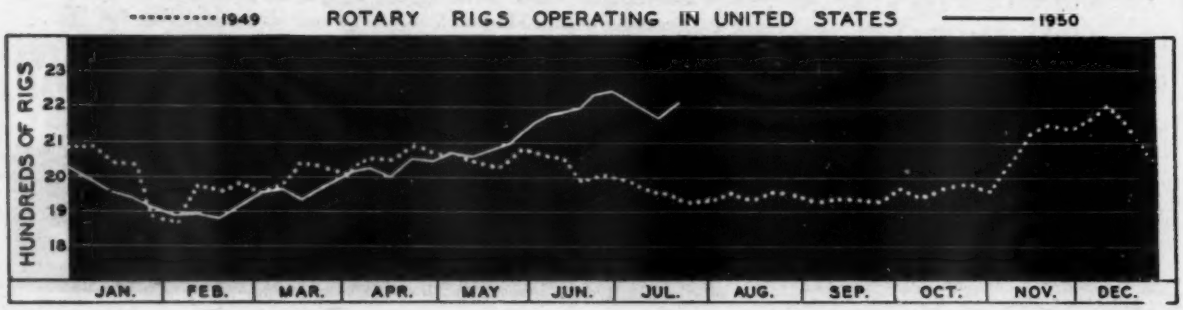
EXPLORATION

WEEKLY WELL COMPLETIONS . . . . . WEEK ENDED JULY 29, 1950

	Total of all wells					July 29		Wildcat completions and discoveries									
													Cumulative total, 1950				
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	12	6	0	*6	14,197	372	652	0	0	0	0	0	0	0	0	0	0
Pennsylvania	18	6	3	†9	32,093	784	1,021	0	0	0	0	0	0	0	1	2	3
West Virginia	9	0	8	1	26,951	372	284	0	0	0	0	0	0	0	11	13	24
Ohio	26	8	4	‡14	56,020	562	628	0	0	1	0	1	1	0	2	7	10
Indiana	51	21	3	27	81,849	904	744	1	0	0	8	9	27	0	1	159	187
Kentucky	29	12	4	13	53,606	605	516	1	0	0	3	4	15	0	1	47	63
Illinois	65	38	1	§26	132,439	1,453	1,389	0	0	0	5	5	28	0	1	334	363
Michigan	25	7	3	¶15	51,220	477	555	0	0	0	10	10	18	0	4	158	180
Kansas	77	53	6	‖18	281,709	2,139	1,832	5	0	0	10	15	56	0	5	335	396
Nebraska	3	1	0	2	11,151	56	17	1	0	0	2	3	3	0	1	27	31
Oklahoma	128	68	8	‖52	476,879	3,097	2,460	4	0	0	13	17	96	5	11	376	488
Texas	332	206	12	114	1,416,989	9,314	7,847	11	0	2	60	73	283	22	67	1,462	1,834
North Central (Dist. 7-B & 9)	115	56	2	§57	314,317	2,852	2,554	8	0	1	27	36	125	2	18	561	706
West (Dist. 7-C & 8)	111	87	1	23	572,349	2,750	1,859	1	0	0	16	17	56	2	2	280	340
Panhandle (Dist. 10)	9	4	3	2	28,594	540	605	0	0	0	1	1	1	0	2	12	15
Eastern (Dist. 5, 6, & 6-P)	10	6	1	3	50,014	664	489	0	0	0	3	3	8	3	1	120	132
Gulf Coast (Dist. 2 & 3)	51	33	4	§14	318,170	1,309	1,154	2	0	1	5	8	46	8	25	204	283
Southwest (Dist. 1 & 4)	36	20	1	15	133,545	1,199	1,186	0	0	0	8	8	47	7	19	285	358
Louisiana	50	26	3	21	285,643	1,384	1,268	0	1	0	4	5	29	13	4	111	157
Northern	31	13	3	15	119,411	728	696	0	0	0	4	4	4	2	1	50	57
Southern	19	13	0	‖6	166,232	656	572	0	1	0	0	1	25	11	3	61	100
Arkansas	10	5	0	5	30,277	233	185	0	0	0	4	4	5	0	0	56	61
Mississippi	5	2	0	3	39,407	186	207	0	0	0	2	2	8	2	0	66	76
Southeastern States	2	1	0	1	10,893	38	27	0	0	0	1	1	1	0	1	23	25
Montana	4	0	0	4	22,740	108	135	0	0	0	4	4	1	0	0	18	19
Wyoming	14	7	0	7	73,228	316	338	0	0	0	2	2	10	0	0	40	50
Colorado-Utah	2	0	0	2	8,869	39	72	0	0	0	2	2	2	0	0	30	32
New Mexico	3	3	0	0	25,059	344	313	0	0	0	0	0	10	1	0	30	41
California	42	29	0	13	177,916	994	1,543	0	0	0	6	6	14	0	2	209	225
Miscellaneous	0	0	0	0	0	34	15	0	0	0	0	0	0	0	0	9	9
Total United States	907	499	55	353	3,309,135	23,811	22,048	23	1	3	136	163	607	43	112	3,512	4,274
Total previous week	917	498	61	356	3,352,748	....	....	25	1	1	151	178	584	42	109	3,376	4,111
Total July 29, 1949	800	429	57	314	2,901,572	....	....	22	1	7	124	154	534	52	112	3,146	3,844

Service wells included: *6, †7, ‡2, §1, ¶3, ‖4.





DAILY AVERAGE PRODUCTION FOR WEEK

	July 29 crude oil	B. of M. July demand	July 22 crude oil
Alabama	1,900	1,600	1,750
Arkansas	81,400	89,000	81,000
California	889,800	860,000	886,400
Colorado	58,600	68,000	59,400
Eastern	62,850	63,000	63,000
Florida	1,525	1,400	1,400
Illinois	177,800	186,000	172,700
Indiana	31,100	30,000	31,100
Kansas	301,550	290,000	322,600
Kentucky	28,900	28,000	28,300
Louisiana	561,850	565,000	560,700
North Louisiana	116,550	.....	115,400
South Louisiana	445,300	.....	445,300
Michigan	47,900	47,000	42,500
Mississippi	108,850	110,000	113,750
Montana	22,300	25,000	22,200
Nebraska	2,450	3,000	2,450
New Mexico	132,575	148,000	132,575
Oklahoma	445,250	445,000	442,100
Texas	2,329,900	2,190,000	2,329,900
Dist. 1 (Southwest)	29,450	.....	29,450
Dist. 2 (Southwest)	138,875	.....	138,875
Dist. 4 (Southwest)	218,000	.....	218,000
Dist. 3 (Gulf Coast)	390,150	.....	390,150
Dist. 5 (Eastern)	36,200	.....	36,200
Dist. 6 (Eastern)	93,600	.....	93,600
East Texas field	275,400	.....	275,400
Dist. 7-C (West)	57,725	.....	57,725
Dist. 8 (West)	772,775	.....	772,775
Dist. 7-B (W. Central)	72,100	.....	72,100
Dist. 9 (N. Central)	153,100	.....	153,100
Dist. 10 (Panhandle)	92,525	.....	92,525
Utah	3,600	4,000	3,600
Wyoming	158,500	156,000	158,300
Total United States	*5,448,600	5,310,000	5,455,725
Change from prev. week, down	7,125		
Canada	85,260	.....	85,260

Total U. S. production January 1-July 29 ..... †1,076,178,040 bbl.
Same period last year (crude plus cond.) ..... 1,076,229,875 bbl.

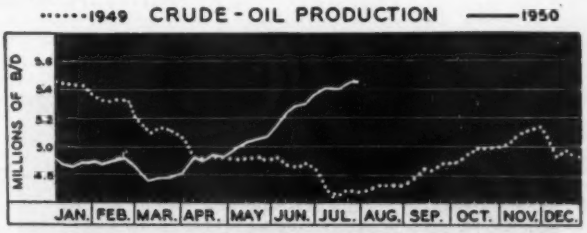
*Not including 98,050 bbl. condensate. †Including 20,471,990 bbl. condensate.

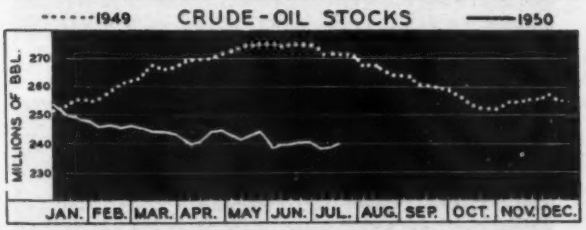
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

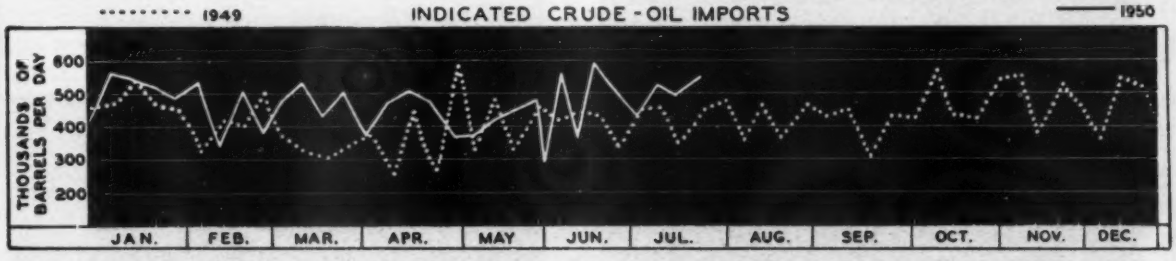
(Thousands of barrels)

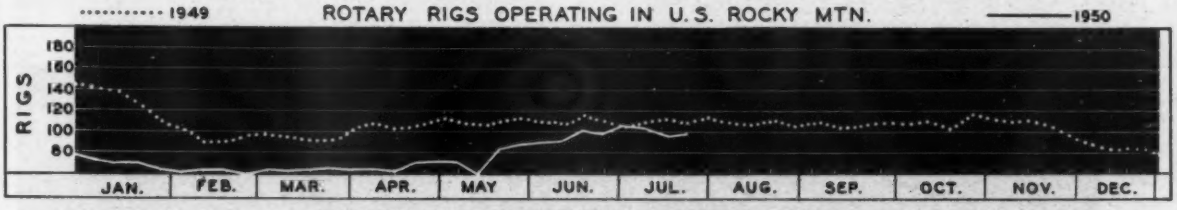
	July 22, 1950	July 15, 1950	July 23, 1949
Pennsylvania Grade	2,702	2,754	3,064
Other Appalachian	1,434	1,579	2,069
Illinois, Indiana, Michigan	9,340	9,071	15,366
Arkansas	2,773	2,808	2,960
Louisiana	15,069	15,202	15,407
North	3,263	3,118	3,671
Gulf	11,806	12,084	11,736
Mississippi	2,243	2,394	3,263
New Mexico	5,949	6,188	7,757
Oklahoma and Kansas	33,472	33,126	39,054
Texas	113,511	112,098	125,476
East Texas	15,289	15,682	16,832
West Texas	42,089	41,250	50,623
Texas Gulf	27,477	27,693	29,550
Other Texas	28,656	27,473	28,471
Rocky Mountain	12,069	12,220	14,205
California	34,245	34,536	35,760
Foreign	6,844	6,509	7,769
Total	239,651	238,485	272,150

*Bureau of Mines.





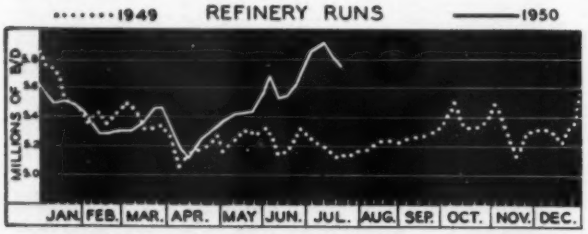


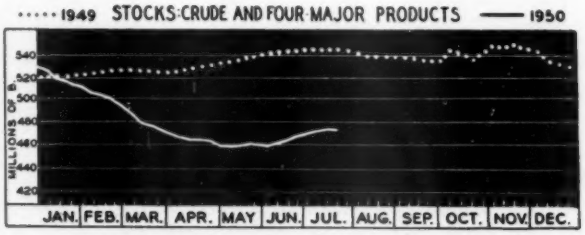


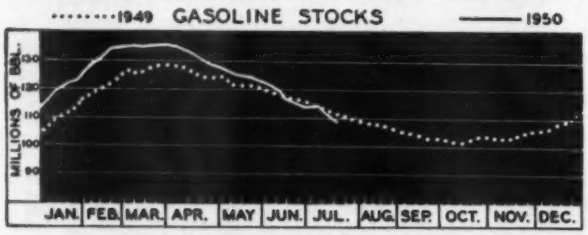
A.P.I. REFINERY REPORT, JULY 22
(Thousands of barrels)

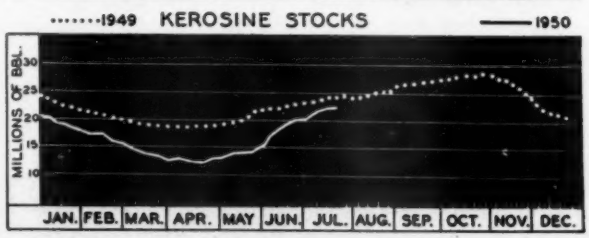
District—	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline†	Kerosine	Distillate	Residual	Bureau of Mines, July 1949: Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	962	408.7	27.6	207.1	222.3	24,827	7,629	15,061	11,191	745	319.2	23.3	155.4	161.7
Appalachian:														
District 1	96	42.4	3.4	13.7	9.9	2,383	423	687	387	87	40.7	2.7	11.4	8.9
District 2	71	36.1	3.4	7.7	14.6	916	150	200	244	64	35.4	1.3	6.0	12.0
Ind., Ill., Ky.	1,064	567.4	53.3	161.0	126.4	22,170	4,446	9,827	4,014	895	492.3	42.9	122.0	117.1
Okla., Kans., Mo.	503	279.9	16.2	112.7	57.7	10,928	1,286	5,655	1,309	427	238.0	17.9	82.3	57.6
Inland Texas	208	141.0	10.1	34.9	39.4	3,099	507	1,130	772	227	156.4	12.3	18.2	49.3
Texas Gulf Coast	1,193	596.2	88.3	223.4	220.3	16,749	3,932	9,479	4,708	1,217	623.0	66.2	176.7	225.9
La. Gulf Coast	488	237.7	44.3	105.0	63.0	5,342	2,530	2,956	1,809	404	212.4	38.0	88.0	45.3
N. La. and Ark.	67	27.3	7.0	15.0	13.8	2,348	523	723	272	73	31.3	5.1	11.2	14.9
Rocky Mountain:														
New Mexico	13	7.6	0.4	1.7	2.9	100	25	77	33	12	6.7	0.2	2.3	3.2
Other Rocky Mtn.	178	84.1	7.9	32.6	34.0	4,140	435	1,581	788	175	76.8	4.5	29.8	33.5
California	914	391.6	2.1	108.9	346.6	15,913	880	12,058	16,897	847	381.0	10.6	131.2	310.9
July 22, 1950	5,757	2,822.0	264.0	1,023.7	1,150.9	108,915	22,766	59,434	42,424	5,173	2,613.2	225.0	834.5	1,040.3
July 15, 1950	5,806	2,758.7	306.7	1,025.6	1,146.6	111,739	22,532	58,658	42,708	.....	.....	.....	.....	.....
July 23, 1949	5,148	2,614.4	213.0	829.6	1,069.9	110,569	24,544	69,365	68,517	.....	.....	.....	.....	.....

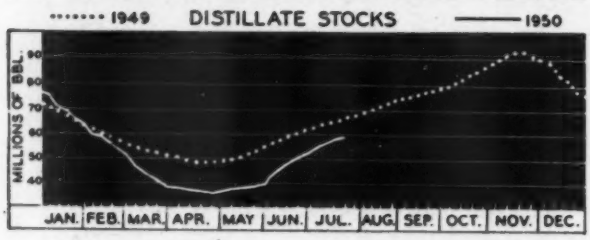
*At refineries including natural blended. †Finished and unfinished.

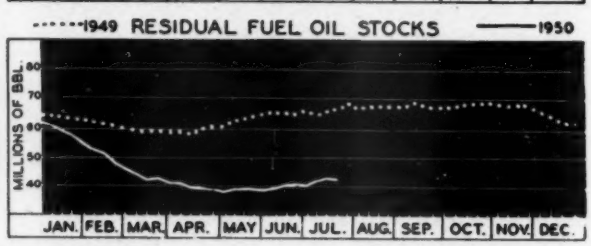


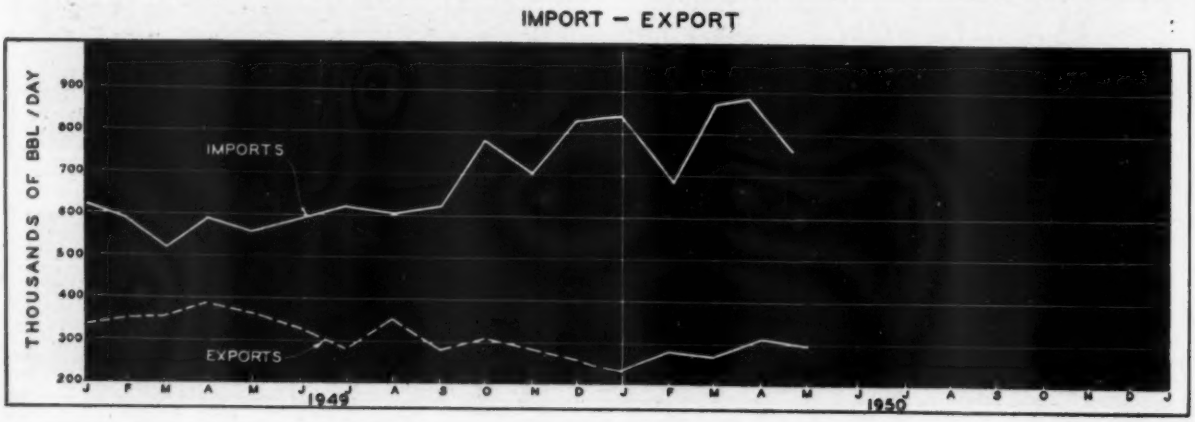












CRUDE PRICES

GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex †
18-18.9	$1.69	....	....	....
19-19.9	1.77	....	....	....
20-20.9	1.85	$2.25	....	$2.12
21-21.9	1.93	2.27	....	2.14
22-22.9	2.00	2.29	....	2.16
23-23.9	2.08	2.31	....	2.18
24-24.9	2.15	2.33	$2.56	2.20
25-25.9	2.23	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9	..	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.89
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

THE general strengthening of crude oil and all principal petroleum products markets continued during the past week, according to reports from nearly all sections of the country.

The most concrete evidence of the tightening of the crude-oil market was the announcement by Standard Oil Co. of California of another increase in the price it would pay for heavy crude oil effective July 26, and an increase of 10 cents in the selling price of residual fuel. (See story in news section of this issue.)

Stepped-up industrial activity has given additional strength to light and heavy fuel oils. On the Atlantic seaboard the strengthening petroleum market was reflected at Philadelphia as Atlantic Refining Co. moved Nos. 4, 5, and 6 oil postings up 10 cents per barrel, effective July 28. Tank-wagon prices for Nos. 2 and 6 fuel oils are expected to be advanced at New York Harbor because of difficulty some suppliers are experiencing in replacing heating fuels along the Gulf Coast at current prices.

Some Gulf Coast refiners are reported to be declining any new business, and others are said to be awaiting the offering of premiums. Spot cargoes of gasoline are now bringing premiums on the Gulf Coast.

As a result of the Government's reactivation of three synthetic-rubber plants, which will take a large portion of the available butane for butadiene production, supplies of butane on the open market are dwindling.

Lubricating-oil prices are firming rapidly in Pennsylvania and the Mid-Continent areas.

All reports are of a very firm wholesale gasoline market, despite a few much-publicized local service-station price wars in New Jersey.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotation of leading suppliers as of July 31, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10¼-10½	12.75	10⅞-11½
Premium gasoline, 86-88 octane	11-11½	13.75	11½-12½
42-44 w.w. kerosine	8⅜-8½	9.1	8-8½
No. 2 straw fuel oil	7½-7⅝	8.0	7-7¼
No. 6 residual	$1.65-1.75	$2.15	$1.75-1.85

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5⅞	5⅞	5⅝
Grade 18-55	7.05	6.55	6.80

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	11.5-12.5
750 vis., No. 3-4 neutral	13.75-14.75
2,000 No. 5-6 neutral	15.5-16.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	21
200 vis., No. 3 neutral, 0-10 pp.	13.5

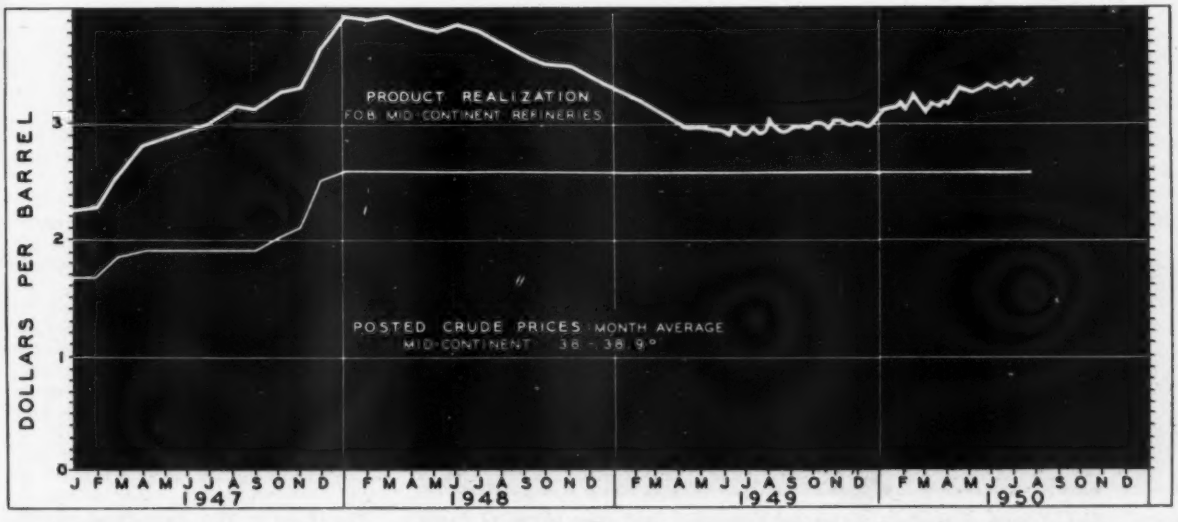
Western Pennsylvani

145-155 vis., 10 p.t. bright stock	25.5
180 vis., 0 p.t. neutral	25.5

WAX

Mid-Continent

132-134 A.M.P.	4.50



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.39 for week ended July 22, $3.34 for previous week, and $2.97 for July 1949.

XUM

EQUIPMENT MEN . . . in the News

McKay Made Executive Vice President of Southern

A. E. McKAY

A. E. (Sandy) McKay has been appointed executive vice president of Southern Geophysical Co. in Fort Worth, Dr. Sidon Harris, president of the company, has announced.

McKay goes to Fort Worth from Dallas, where for the past 6 years he has been assistant chief geophysicist for Atlantic Refining Co. He has been actively engaged in oil exploration since he received his B.S. degree in geology from the University of Oklahoma in 1928.

McKay's first position was with Indian Territory Illuminating Oil Co. of Bartlesville, Okla., and he served this company until 1937 when he joined Atlantic.

Totco Names Stack to Sales Staff at Abilene

H. H. (Pete) Peters, vice president of Technical Oil Tool Corp., Ltd., anannounced recently the appointment of Lloyd D. Stack as Totco sales representative in Abilene, Tex. Stack will help handle increased activity in the Snyder-Abilene area. A graduate of Texas Technological Institute he has gained practical field experience by working for drilling contractors in West Texas.

Peters stated that with the addition of Stack the company now serves the West Texas-Permian Basin area with representatives in Odessa, Lubbock, Snyder, and Abilene, Tex., as well as Hobbs, N. M., all operating under the direction of Ed Siever, division manager, located at Odessa.

Jones Named Manager of Moore's Los Angeles Branch

Donald R. A. Jones has been appointed manager of the branch office at Los Angeles of Moore Products Co.

Jones brings to the Moore organization a wide experience in the process industries, as a consulting engineer and as an industrial gas engineer with Southen California Gas Co. He received his engineering degree from the University of California.

Decker Returns to New Position for Schlumberger

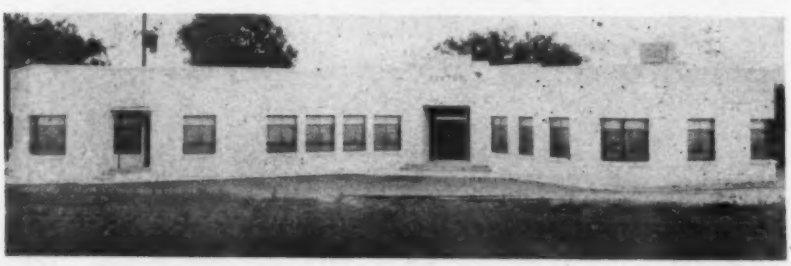
G. J. DECKER

G. J. Decker, who was on a temporary assignment in Edmonton, Canada, for Schlumberger Well Surveying Corp., has returned to the United States. He has been promoted to the position of Kansas division manager for Schlumberger and will be located in Wichita, Kans.

Oilwell's London Office Occupies New Quarters

The London office of Oil Well Supply Co.'s export division is now at a new address, M. E. Keenan, export division manager for this U. S. Steel subsidiary, has announced. The address of the office is now: 5 Queen Street, London, E.C. 4, England. Manager of the London office is C. T. Longcroft.

Rector Occupies New Fort Worth Building



General offices, drafting department, accounting department, and sales offices of Rector Well Equipment Co., Inc., have been moved from the Fort Worth National Bank building to this new, one-story office building, just across the street from the firm's plant at Fort Worth, which was enlarged last year.

Caterpillar Names Two To Sell Pipe Line Pumps

Two special representatives of Caterpillar Tractor Co., Ross V. Osterhout and Ted I. Reese, have been

R. V. OSTERHOUT

T. I. REESE

named to assist in the introduction of the company's new portable pumping unit to the pipe line industry, according to a recent announcement by C. E. Jones, manager, Caterpillar Sales Development Division.

Osterhout has been in the oil-producing industry for many years. Prior to joining the Engine Sales Division of Caterpillar Tractor Co. in 1943, he was associated with National Supply Co., Continental Supply Co., Sinclair Oil Co., and the Indian Territory Illuminating Oil Co.

Reese started with Caterpillar's service department in 1942. After serving in the armed forces he returned to Caterpillar in 1947, as a member of the Service Claims Department for the Eastern Sales Division and remained in that capacity until his recent transfer to the Sales Development Division of Caterpillar's Sales Department.

Cyanamid to Erect New Catalyst Plant at Chicago

American Cyanamid Co. has announced that it will soon begin construction of a $3,000,000 plant in East Chicago, Ind. The new plant will produce cracking catalysts for the important segments of the petroleum industry located in the Midwest and along the Atlantic seaboard.

Cyanamid is a leading producer of synthetic catalysts and when the East Chicago plant is completed, present capacity will be increased by more than 50 per cent, which will mean production of more than 3,000 tons of these catalysts per month. It is expected that the new facilities will be in operation about the middle of 1951.

The firm is the only producer of microspheroidal cracking catalysts. At the new plant, production will be devoted primarily to these micro-

spheroidal type catalysts. In its consolidated research laboratories in Stamford, Conn., the company maintains facilities for development and application studies of new catalysts, as well as lubricating-oil additives and other products used by this industry.

In addition to cracking catalysts and lubricating-oil additives, Cyanamid also produces drilling-mud chemicals, dyes for gasolines and oils, and stearated and similar products for the petroleum industry.

Burner Joins Ideco as District Manager

L. E. BURNER

T. D. (Hi) Collins, vice president of the Supply Stores division, International Derrick & Equipment Co., recently announced that LeRoy E. Burner, formerly special sales representative for National Supply Co., has joined the Ideco Supply store staff as district manager for the state of Oklahoma. He will office in Oklahoma City.

Burner joined National Supply in 1935 and moved rapidly up, successively holding the positions of field salesman, store manager, district sales representative, and special sales representative.

R. H. Cramer Named General Manager of Hyatt Bearings

Appointment of Raymond H. Cramer as general manager of Hyatt Bearings Division of General Motors Corp. at Harrison, N. J., has been announced by C. E. Wilson, president of General Motors. Cramer succeeds the late H. O. K. Meister, who died June 10.

Shortly after assuming his new duties, Cramer announced the appointment of H. R. Gibbons to the position of chief engineer in full charge of product design, research, application, and service engineering. Gibbons succeeds O. W. Young who assumes new duties as technical assistant to the office of the general manager.

Cramer has been with Hyatt Bearings since 1924 as tool designer, assistant chief inspector, supervisor of standards, tool and maintenance divisions, assistant factory manager, and in 1942, was made factory manager.

Gibbons, who joined Hyatt in 1914, has been assistant chief engineer for the past 7 years. He graduated from Stevens Institute of Technology. Owens has been associated with Hyatt since 1915 and has served as chief engineer since 1928.

Houston Group Plans Instrument Exhibit and Conference

Members of the Houston section of the Instrument Society of America planning the sixth national conference and exhibit, to be held September 10-14, are: C. E. Naylor, president, Maintenance Engineering Corp.; Porter Hart, Dow Chemical Co.; R. J. S. Piggott, director of engineering, Gulf Research & Development Co. and national president of I. S. A.; James Griffith, Houston City Council; William V. Houston, president, Rice Institute; A. P. Beutel, vice president, Dow Chemical; Hines H. Baker, president, Humble Oil & Refining Co.; Gerald McMahon, vice president, Flow Meter Co.; and W. H. Fortney, Humble Oil & Refining Co.

M. B. Skinner Announces New Plant Addition

M. B. Skinner Co., South Bend, Ind., manufacturers of pipe-repair clamps and saddles, has just broken ground for a plant addition that will increase production space by 50 per cent.

This action is the result of increasing sales over the past 10 years and the acceptance of new items that have been added to the firm's line since the war.

Schults Wins Frank Brown Golf Trophy

Henry J. McAdams, president of the New York chapter of Nomads, is shown awarding the I. Frank Brown award to Tommy N. Shults. Only members are eligible to compete for the trophy. The event occurred during the annual June golf party held by the New York chapter which, this year, was attended by 98 golfers.

Halliburton Announces New Sales Organization Changes

R. G. Kelly, Halliburton Oil Well Cementing Co.'s West Texas - New Mexico division superintendent at

R. G. KELLY

P. C. MAYFIELD

Midland, has been named central region manager and transferred to Halliburton's home office, at Duncan, Okla. The new regional manager will supervise Halliburton's California, West Texas - New Mexico, Central Texas, East Texas, and North Louisiana divisions.

Succeeding Kelly as West Texas-New Mexico division superintendent at Midland is P. C. (Bill) Mayfield, former assistant superintendent. New assistant superintendents at Midland are Leroy Muse and B. H. (Joe) Clark.

Kelly was promoted to Halliburton's Central Region managership to fill the post vacated by L. B. Meaders, Halliburton vice president who on July 1 became vice president in charge of field operations. The new regional manager was employed by Halliburton in May 1940 at Odessa, Tex. Assignments followed at Hobbs, N. M.; Midland; and Shreveport, La., where he became superintendent of Halliburton's North Louisiana division. He returned to Midland in 1947

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as West Texas-New Mexico division superintendent.

Mayfield began with Halliburton at Kermit, Tex.; was promoted to fieldman at Big Lake, Tex.; and came to Midland in August 1947 as assistant superintendent.

Continental Names Two New Store Managers

Continental Supply Co. has announced the appointment of R. C. Wiggins as manager of the Russell, Kans., store where he has been serving as assistant manager.

Also announced is the appointment of R. W. Woodside as manager of the New Harmony, Ind., store, being transferred from Henderson, Ky., where he has been floorman.

Long Named Asst. General Manager of Oil Base, Inc.

JACK LONG

George Miller, president, Oil Base, Inc., Compton, Calif., has announced the appointment of Jack Long as assistant general manager. He will divide his time between management and sales of Black Magic oil-base drilling fluid, White Magic oil-emulsion mud, and other mud-conditioning products manufactured by Oil Base, Inc.

Formerly in sales, Long will bring a well-rounded mud engineering experience to the newly created post and will relieve George Miller to devote full time to affairs of management and product distribution.

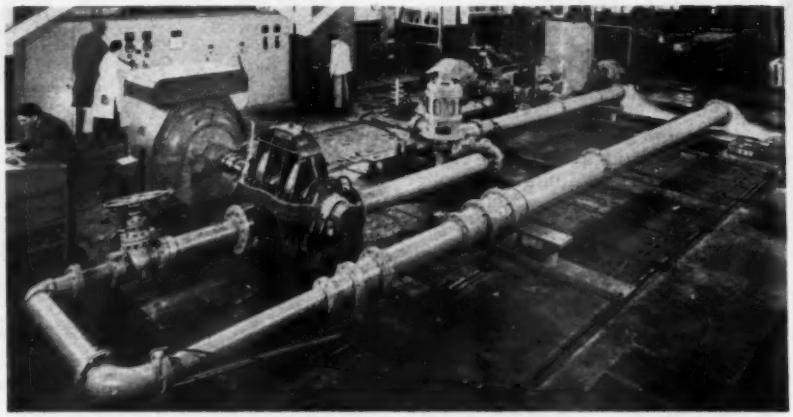
Hudson Named to Oakite Petroleum Service Staff

Oakite Products, Inc., New York, has announced the recent appointment of J. D. Hudson to its Petroleum Service Division staff. Hudson will operate from the company's offices in Dallas.

A graduate of Mississippi State College, Hudson did postgraduate work at Massachusetts Institute of Technology before entering the refinery construction field in the Louisiana area in 1935. In 1943 he joined Cities Service Corp. at Lake Charles, La., remaining with that organization until immediately prior to his appointment by Oakite.

In his new work, Hudson will assist the company's field representatives in providing additional technical advisory service on special problems arising in connection with petroleum industry cleaning and allied operations.

Bingham Completes Hydraulic Testing Laboratory



The completion of this large and completely equipped hydraulic testing laboratory has been announced by Bingham Pump Co., Portland, Ore. Field conditions are reproduced for all horizontal and vertical pumps and compressors before shipment. The plant has sufficient capacity to test pumps with power requirements up to 3,000 hp.

Thew-Lorain Offers New Film on Pipeliners

A new, 16 mm. film entitled "Thew-Lorain Pipeliners" has been produced by Thew Shovel Co., Lorain, Ohio. This is the sixth of a series of full color, sound films depicting the application of Thew-Lorain power shovels and cranes to special industries.

This latest film is 20 minutes long and covers the application and use of wide-gage crawler and rubber-tire Lorains to cross-country construction of pipe lines. Most of the scenes are in the mountains of Missouri, Tennessee, and Kentucky. The film is available to any company or group.

Beckloff Is Manager of Ryerson's Tubing Division

A. P. BECKLOFF

Allen P. Beckloff has been appointed manager of the Tubular Products Division of Joseph T. Ryerson & Son., Inc., steel distributors, it has been announced by H. B. Ressler, first vice president. He was manager of the Tubular Products Department of the Ryerson plant in Cleveland and succeeds R. W. Burt who was recently appointed Chicago plant sales manager of the company.

Beckloff started in the Ryerson Cleveland plant in 1941. In his new position with headquarters at Chicago, he will direct and coordinate, on a national basis, all merchandising activities in connection with the distribution of seamless and welded mechanical and pressure tubes from stock.

Jorgensen Names Schriber To Board of Directors

C. SCHRIBER

Charles Schriber has been appointed a vice president and director of Earle M. Jorgensen Co., steel distributors with plants in Los Angeles, Oakland, Houston, and Dallas, according to a recent announcement by Earle M. Jorgensen, president of the firm.

Prior to becoming associated with Jorgensen in January of this year, Schriber was a vice president of Republic Supply Co. of California, where he started his business career in 1940 upon graduation from Williams College, Williamstown, Mass., with a B.A. degree. He was appointed manager of sales of the Jorgensen's Los Angeles office in April, and will continue in this position.

Squier Co. Is Nearing Millionth Computation

During the month of August 1950, coincidental with the fifth anniversary of the organization, John P. Squier Co., Dallas, will compute by integration the 1,000,000th orifice-meter flow chart for an independent oil and gas operator.

The company was founded in 1945 for the purpose of offering daily integration and return of meter charts for marketers and buyers of natural gas. The 1,000,000th computation will represent a total of more than 5 trillion cubic feet of gas computed over a 5-year period from installations covering 11 states.

F. F. Roehll Names Sales Manager of Eutectic

Appointment of F. F. Roehll as national sales manager, Eutectic Welding Alloys Corp., has been announced by Rene D. Wasserman, president. The company manufactures a complete line of welding rods, electrodes, and fluxes.

A graduate of Ohio State University, Roehll has devoted his entire career to sales and sales management, with particular emphasis on the industrial field. He entered the service of Eutectic shortly after the war as a local district engineer in California. After several years of service in the west, Roehll was transferred to the New York office where he served as sales supervisor.

Penn Names Bennett as General Sales Manager

Penn Industrial Instrument Corp., manufacturers of Hays-Penn flow meters and Penn temperature and pressure recorders and controllers, has announced the appointment of James W. Bennett as general sales manager.

Bennett has devoted his entire business career to process and powerplant instrumentation since he was graduated in 1939 from University of Cincinnati with a degree in mechanical engineering.

For the past 5 years he has done special enginering sales work for Energy Control Co. of New York and Philadelphia.

Tilco-Fin Names Brock Mott As District Representative

Tilco-Fin Division of David E. Kennedy, Inc., Brooklyn, N. M., manufacturers of fin tubing, has announced the appointment of Brock Mott as district representative.

Mott attended the engineering school of the University of Tulsa and is a graduate of United States Naval Academy. He was an engineer for Pressed Steel Car Co.'s Armored Tank Division in Chicago prior to entering the Navy.

After the war, Mott joined Joseph A. Coy & Co., Tulsa, Okla., as district engineer. He left this firm to establish Brock Mott Co., manufacturers' agents and sales engineers, in Tulsa. His territory with Tilco-Fin will include Texas, Oklahoma, Kansas, and Nebraska.

Collins Joins Alloy Steel As Sales Representative

Alloy Steel Products Co., Inc., of Linden, N. J., manufacturers of stainless steel valves and fittings, has appointed S. W. Collins as sales representative for the states of Oklahoma and Kansas, with offices at Tulsa.

Collins recently returned to the Mid-Continent area from New York City where he had represented Pacific Valve Co. Previously he had been assistant district manager in the Oklahoma area for Oklahoma Refinery & Machinery Co.

Emsco Adds Canadian Slush Pump Sales and Service

Emsco Derrick & Equipment Co. has announced the appointment of Oil Equipment, Ltd., as general distributor for Emsco slush pumps and spare parts in Western Canada.

In addition to the general distributor, the following supply companies have been named as new pump sales agents: Dominion Oilfields Supply Co., Ltd.; Rocky Mountain Supply Co., Ltd.; and Farmington Supply Co.

General Controls Adds Sales Engineers

General Controls, Glendale, Calif., manufacturers of automatic pressure, temperature, level, and flow controls has announced four new appointments to its staff of sales engineers. Jack Ray, vice president in charge of sales reports the assignment of William Stringfellow to the Dallas branch office; Hamilton G. Sudler to New York, Earnest F. Bruegel to Philadelphia, and R. Roedder to Los Angeles.

(Continued on page 119)

North Central Texas

(Continued from page 104)

TD 3,360 ft., elev. 1,518 ft., Lake sand 3,287 ft., perf. 3,290-3,303 ft., flowed 102.95 bbl. of 41.5°-gravity oil in 7 hr., 18/64-in. choke, GOR 601 cu. ft., CP 275 psi., TP 250 psi.

Jones Connty: Grisham-Hunter 1 J. G. Whaley, 65-2-SPRR Sur., 6 mi. E Hamlin, TD 3,150 ft., elev. 1,671 ft., perf. 3,141-44 ft., flowed 88 bbl. of 41.8°-gravity oil in 8 hr., 18/64-in. choke, GOR 242 cu. ft., CP 410 psi., TP 430 cu. ft.

Taylor County: J. D. Andrews 1 J. Bull, Sec. 456, John Walker Sur., 1 mi. E Bradshaw, TD 4,916 ft., PB 4,490 ft., Gray sand 4,453 ft., perf. 4,452-60 ft., flowed 17 bbl. of 41.5°-gravity oil a day, 12/64-in. choke, GOR 1,878 cu. ft., CP 525 psi., TP 175 psi.

Wichita County: Wm. Herbert Hunt 1 N. R. Temple, Blk. 13, Coherd Bros. Subd., Palo Pinto CSL, 7 mi. W Wichita Falls, TD 4,149 ft., elev. 1,020 ft., perf. 4,094-4,106 ft., pumped 85 bbl. of 42°-gravity oil a day, GOR 400 cu. ft.

Wise County: Mid-Continent Petroleum Corp. 1 M. S. McBride "B," W. Burk Sur., A-39, 2 mi. S Paradise, TD 6,000 ft., perf. 5,525-30 ft., flowed 2,175,000 cu. ft. of gas, open 2-in. tubing, SI casing pressure 1,290 psi.

Young County: Portable Drilling Corp. 1 L. F. Atwood, Sec. 1,660, TE&L Sur., 15 mi. SW New Castle, TD 4,670 ft., Caddo 3,696 ft., pay 3,718 ft., pumped 5 bbl. of oil a day, perf. 3,718-31 ft.

NORTH TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: L. T. Burns 1 J. L. Sibert, Lot 26, Blk. 3, Clark & Plumb, ½ mi. E Scotland, dry, TD 4,749 ft. in shale.

Cochran & Cain 1 L. F. Wilson, Blk. 89, American New Tribune Colony Lands, 7 mi. N Archer City, dry, TD 1,505 ft., Gunsight 1,471-74 ft.

Cullum Bros. 1 W. S. L. Foster, Sec. 2, Hooper-Wade Sur., A-922, 1½ mi. S Archer City, dry, TD 3,804 ft.

Ted A. Norwood 1 J. H. Turberville, Blk. 113, American Tribune New Colony Sur., A-9, 8 mi. SE Mankins, dry, TD 1,521 ft.

Ted A. Norwood 1 L. F. Wilson, Blk. 112, American Tribune New Colony Subd., J. M. Taylor Sur. 2, A-656, 8 mi. SE Mankins, dry, TD 1,570 ft.

Coleman County: Haynes B. Owenby Drilling Co. 1 Hubert Stokes, T. Smith Sur. 68, 4 mi. NE Talpa, dry, TD 3,654 ft., Gray sand 3,600 ft.

Comanche County: United North & South Development Co. 1 J. B. Aldridge, David Scott Sur. 305, 14 mi. SW Comanche, dry, TD 4,912 ft., elev. 1,683 ft., Marble Falls 2,787 ft., Ellenburger 3,029 ft., Hickory sand 4,700 ft.

Cooke County: Houston Bowers 1 B. G. Grotte, T. Toby Sur., A-1050, 3 mi. SW Bulcher, dry, TD 3,404 ft.

Bridwell Oil Co. 1 S. W. Poyner, T. Wisdom Sur., A-1167, 5 mi. SW Bulcher, dry, TD 3,003 ft. in shale, show of oil 2,769-87 ft.

Stephen G. Pappas 1 L. Enderley, M. Hunt Sur., A-449, 4 mi. NE Era, dry, TD 1,751 ft., lime 1,723 ft.

Fisher County: Major Drilling Co. 1 Docia Bowman, Sec. 2, Blk. 2, Sallie A. English Sur., 2½ mi. SE McCaulley, dry, TD 5,150 ft.

Haskell County: Crown Central Petroleum Corp. 1-B R. A. Gillespie, 2-3-H&TC, 867 ft. NE 1 Gillespie, dry, TD 1,702 ft., elev. 1,569 ft., Valera 380 ft., Saddle Creek 1,483 ft.

Jones County: C. A. Douthit and Eck Gillespie 1 W. Culbreath, 1-8-K. L. Moore, 3 mi. N Nugent, dry, TD 2,043 ft. in shale.

W. W. Harvey and West Central Drilling Co. 1 M. D. Blackwell, Holt & Swenson Subd., G. Martinez Sur. 194, 3 mi. N Hawley, dry, TD 2,356 ft., elev. 1,716 ft., Flippen 2,200 ft., Hope 2,301 ft.

S. C. Herring Drilling Co. 1 I. F. Wiley, Sec. 36, D&D Asylum Lands, 5 mi. NE Anson, dry, TD 3,700 ft., elev. 1,603 ft., sand with oil show 3,303-88 ft.

Sohio Petroleum Co. 1 Eason, 9-17-T&P, 3 mi. SE Truby, dry, TD 4,715 ft., elev. 1,702 ft., Dothan 1,978 ft., Marble Falls 2,083 ft., King sand 2,767 ft., Canyon 3,410 ft., Palo Pinto 3,965 ft.

Montague County: R. C. Lipscomb 1 J. W. Senn, C. M. Harmon Sur., A-344, 4½ mi. S Montague, dry, TD 6,617 ft., Caddo 6,244 ft.

Nolan County: C. L. Norsworthy 1 R. H. Jordan, NE NE 36-1-A-H&TC, 5 mi. NW Blackwell, dry, TD 6,956 ft., elev. 2,211 ft., sand 4,030 ft., Ellenburger 6,500 ft., Hickory sand 6,939 ft.

Sun Oil Co. 2 B. K. Stone, SW SE 77-X-T&P, 11½ mi. SW Sweetwater, dry, TD 6,000 ft., elev. 2,595 ft., reef 5,890 ft.

Shackelford County: Exploration Drilling Co., Inc. 1 J. F. Dyer, 84-12-T&P, 12 mi. N Baird, dry, TD 937 ft. in shale.

Oxford Drilling Co. 3-A McMahon & Doss, Sec. 1533, TE&L Sur., 11 mi. E Albany, dry, TD 2,505 ft., sand 2,496-2,505 ft.

Harry L. Todd 1 T. W. Lee, 32-11-T&P, 5 mi. SW Albany, dry, TD 1,490 ft., Sedwick 552 ft., Dothan 707 ft., Camp Colorado 785 ft., Saddle Creek 986 ft., Crystal Falls 1,153 ft., Breckenridge 1,210 ft.

Harry L. Todd 1 B. S. Walker, Sec. 2, BS&F Sur., 8 mi. N Albany, dry, TD 881 ft., Sedwick 198 ft., Dothan 365 ft., Breckenridge 856 ft.

Taylor County: Hooker - deMohrenschildt, Ltd. 1 Dennis Q. Lilly, 3-9-SPRR, 10 mi. S Merkel, dry, TD 3,150 ft., elev. 2,026 ft.

E. H. Sabens 1 Abilene Christian College, Sec. 24,, BAL Sur., 2 mi. NE Abilene, dry, TD 2,002 ft., Flippen 1,740 ft.

Wichita County: Palmer Drilling Co. 1 Goetze Bros., Blk. 2, BS&F Sur., A-697, 3 mi. W Clara, dry, TD 1,067 ft.

Wilbarger County: Shamrock Oil & Gas Corp. 1 Leroy Wright, 15-16-H&TC, 2 mi. S Tolbert, dry, TD 5,220 ft.

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FOR SALE: One 7¼ x 14 Whelan model 11000 Slush pump. New fluid end, gear box A-1. Melton Supply Company, Box 1360, Seminole, Oklahoma.

WELL equipment. New and used spudders, rotaries, core drills, all sizes and types. Cable tools, drill pipe, bits, pipe. Fishing tools rented. Everything for well service. Pressey & Son, Pueblo, Colo.

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FOR SALE: #3 National DRILLING MACHINE, complete with 12 x 12 floor sills, 3" walk and floor, new bandwheel, casing rack, house, belt hall, steel mast, steel brake wheel with rotary block lined 12" brake band, O.C.S. chain driven sand reel with 2 brakes and chain, turn buckles and guy lines complete, including string of drilling tools complete from 12" to 6" with Wilson elevators, dog house, tool boxes, light plant, water pump. Located at Bristow. Call or write R. R. Kirchner, Bristow, Oklahoma.

PULLING UNIT: 1942 GMC 2 ton truck with Cardwell unit with all tools and extra motor for truck. Skinner Well Service, 414 So. Emporia, El Dorado, Kansas, Phone 1228.

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9—230 H.P. Bessemer Type 10 Engines with compressors, Steel Buildings, Valves and Fittings complete for installation. Located Salem, Illinois Oilfield.

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Gaso, Byron Jackson, Aurora, Wayne, Lombard & Hale Fire Pumps with Engines, 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

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FOR SALE: 35,000 feet new nickel-moly A.P.I. specification sucker rods ¾" x 25' with/ hard and ground couplings. Inquire 10520 Hines Boulevard, Dallas, Texas.

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60c ft. 5⅛" x 4 9/16"
100 lb. Test
Roll or Bolted Couplings—$1 up

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Hydraulic Casing Pulling Units, Hydraulic Jacks, Casing Spiders, Rings & Slips. Also,
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10,000' 2" OD x .220/.250" Wall 4.5# New Seamless P.E. 16'—26' Lengths
20,000' 2½" OD x .280/.330" Wall 7.3# New Seamless P.E. 16' & Over—60% 20'—30' Lengths
25,000' 3" OD x .300/.350" Wall 9# New Seamless P.E. 16' & over—80% 20'—40' Lengths
5,000' 4" OD x .375" Wall 14.5# New Seamless P.E. 16'—21' Lengths
7,000' 5" 5 9/16" OD x .375" Wall 20.73# New Lapweld 20' Lengths
8,000' 6" 6⅝" OD x .250" Wall 17.02# New Armco Spiral Weld 50' Lengths, Beveled Ends
10,000' 8" 8⅝" OD x .250/.280" Wall 24#/28# Used Pipe, P.E.
175,000' 8" 8⅝" OD x .322" Wall 28# Used #2 Grade Lapweld, P.E.
1,000' 8" 8⅝" OD x .250" Wall 22.40# New Armco Spiral Weld 40' Lengths, Beveled Ends
8,000' 10" 10¾" OD x .250" Wall Used Pipe, R.M.L.
200' 12" 12¾" OD x .172" Wall 25# New Armco Spiral Weld 20' Lengths
3,300' 12" 12¾" OD x .375" Wall 50# Used #1 Grade Lapweld 32' to 40' Lengths, P.E., 2 Joints Coupled
108' 14" OD x .750" Wall 106.75# New Seamless 15'—29' Lengths
1,300' 16" OD x .250" Wall 42.05# New Elec. Weld 20'—40' Lengths
500' 18" OD x .250" Wall 47.39# New Elec. Weld 20'—40' Lengths
1,100' 18" OD x .281" Wall 53.22# New Elec. Weld, P.E., 40' Lengths
1,500' 20" OD x .250" Wall 52.73# New Elec. Weld, P.E., 20'—40' Lengths
1,000' 20" OD x .312" Wall 65.70# New Elec. Weld, P.E., 20'—40' Lengths
3,000' 20" OD x .344" Wall 72.16# New Elec. Weld, P.E., 20'—40' Lengths
280' 20" OD x .375" Wall 78.59# New Elec. Weld, P.E., 40' Lengths
2,000' 24" OD x .312" Wall 79.03# New Elec. Weld, P.E., 40' Lengths
5,000' 24" OD x .250/.312" Wall 71.23# New Elec. Weld, P.E., 8'—14' Lengths
600' 24½" OD x .250" Wall 65# New Riveted Pipe, 59' Lengths
6,000' 26" OD x .260/.300" Wall 75.82# New Elec. Weld, P.E. 15'—40' Lengths

NEW AND GOOD USED SEAMLESS AND LAPWELD CASING AND TUBING AVAILABLE IN ALL DESIRABLE SIZES FOR IMMEDIATE DELIVERY, SUBJECT TO PRIOR SALE. WIRE OR PHONE COLLECT, SIDNEY 1791 FOR PRICES—ACT NOW!!!

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CORE-DRILL Equipment for Sale: Two "Franks" truck-mounted core drills, 2,000′ capacity, mounted on KR-11 International Trucks. Three 750 gallon water tanks, skid mounted. Contact Mr. J. D. Baker or Mr. W. H. Hawkes, P. O. Box 1654, Oklahoma City, Oklahoma. Telephone No. 2-6381.

AVAILABLE for sale and immediate shipment #1 T & C 2″ line pipe, seamless and lapweld casing, tanks. Call or write Edco Pipe & Supply Company, Box 565, Drumright, Oklahoma.

FOR SALE: One 350 KW, 480 volts, 3 phase, 60 cycle; and one 480 KW, ditto, Superior natural gas engine generating unit, complete with generating panels. Max E. Landry, Inc., 436 Mayo Building, Tulsa, Oklahoma. Phone 5-5639.

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In Good Condition

10-200 bbl. Panhandle Steel Tanks with steel stairs and walk-ways, 3″ gate valves.

4 Oil and Gas Separators.

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550′ 5½″ 24.70# Youngstown I.U. Grade E R. 3 New Drill Pipe API Threads ..... **$266.97 Hd. Ft.**

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EQUIPMENT FOR SALE

FOR SALE: Failing "86" draw works, with 65′ tubular derrick, skid mounted, powered by Cummings Diesel engine. Ideal mud pump C-150—6¾″ x 12″, powered by D-13000 Caterpillar Diesel engine. 3500′ of 3½″ drill pipe. Failing block and swivel, B J hook, drill collars, kelleys, truck, float, car, two light plants, water pump, tank and line. This rig is complete in every detail with all tools and equipment—ready to move on location. Simmons & Wilson, Hotel Stockton, Ft. Stockton, Texas.

FOR SALE: Wilson Giant draw works, powered by two JL-1335 Buda engines with Wilson chain compound. Unit completely overhauled. Can sell separate or with a complete rig. For information, call or write **Melton Supply Company, Box 1360,** Seminole, Oklahoma.

FOR SALE: Oil handling equipment removed from Government oil barges. Check valves, vents, expansion joints, globe valves, gate valves, high pressure float traps, pipes, pipe fittings, ells, tees, crosses, flanges and strainers. Various sizes. Box D-602, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE near Blackwell, Oklahoma, one Rotary Rig Electric Generating Unit, 175 KW, 480 volt, powered by 2—150 hp. Sterling Gas Engines. Price $6500. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: 300 Amp Westinghouse welding machine powered by 6-BK Waukesha engine. Completely overhauled. Less than 50% of new price. Melton Supply Company, Box 1360, Seminole, Oklahoma.

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30,000 ft. 2⅞″ O.D. STANDARD LINE PIPE, plain end, used.

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First Class Used Casing—Lapweld—Low Prices

10¾″ O.D.—8⅝″ O.D.—7″ O.D.—5½″ O.D. 2″ 4½# tubing, both regular and upset.

EQUIPMENT FOR SALE

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FOR SALE, at Pampa, Texas: 3 Used #400 "A" Masts, 106,000# capacity, 60′ high, 8′ base. Price $350.00 each. Cities Service Oil, Patridge, Bartlesville, Oklahoma.

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ENGINEERS, Executives, Technical Men. Salaried positions — $3600 to $30,000. This confidential service for outstanding men who desire a change of connection will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

PETROLEUM ENGINEER

An expanding volume of business has created a desirable position for a man of considerable experience in heater design for the oil and chemical industries. Reply by letter giving experience, education and salary desired.

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Erie Ave. & "D" St., Phila., 34, Pa.

ESTIMATOR

Experienced ENGINEER familiar with Oil Refinery design and capable of estimating process equipment from flow diagrams.

Give full information, experience record and salary expected.

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2300 CHESTER AVE.
CLEVELAND 1, OHIO

ENGINEER (ARCHITECTURAL)

Desirable permanent position in drafting division of engineering and construction department of major oil company for qualified engineer to supervise employees engaged in preparing final plans, details and perspectives pertaining to industrial building construction. Must have at least 8 years' architectural drafting experience including supervision of draftsmen. Prefer candidate with degree in architecture but will consider equivalent training. Location Philadelphia. Starting salary $446 per month. State education, experience and personal history in first letter.

Address

MR. H. M. OVERLEY
P. O. Box 7258
Phila. 1, Pa.

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REFINERY EQUIPMENT
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COTTON VALLEY, LA.
PHONE: COTTON VALLEY 26

XUM

HELP WANTED

FOREIGN and Domestic Oil Employment Directory covering the oil industry, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla.

DRILLING SUPERINTENDENT: Mid-Continent drilling concern will have opening August 15th for Assistant Drilling Superintendent; age 30 to 35, who has been in supervisory capacity for at least five years as Drilling Superintendent or Tool Pusher. Must have good personality; initiative; and fair educational background. In replying give past five year employment record; state age, marital status and salary expected. All replies handled strictly confidential. Box D-599, The Oil and Gas Journal, Tulsa, Oklahoma.

SEISMIC supervisor—party chief wanted by geophysical company opening branch office in Calgary, Alberta, using seismic, aerial magnetometer and gravimetric methods. Kindly supply details, education, experience, personal data and salary requirements. Applications will be held confidential. Our staff has been advised of this advertisement. Box D-611, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER
(MECHANICAL)

Permanent position in drafting division of engineering and construction department of major oil company. Location in Philadelphia. Prefer candidate with degree in mechanical engineering but will consider equivalent training. Must have at least 8 years' drafting experience including supervision. Duties include supervising work of draftsmen engaged in preparing drawings and bills of material for mechanical equipment and services for buildings, pipe lines, terminal facilities, pump stations, etc. Starting salary $489 per month. State education, experience and personal history in first letter.

Address

MR. H. M. OVERLEY
P. O. Box 7258,
Phila. 1, Pa.

HELP WANTED

EXPERIENCED gasoline plant chemist for product control, water treating, and corrosion control. Graduate chemist or chemical engineer preferred. West Texas location, housing available. Box D-607, The Oil and Gas Journal, Tulsa, Oklahoma.

ASSISTANT PROFESSOR GEOPHYSICS for teaching and research. Location Northeast. Reply: Box D-603, The Oil and Gas Journal, Tulsa, Oklahoma.

ESTABLISHED Seismograph Company has opening for Party Chief. Two years minimum experience in charge of party and college degree in science or engineering required. This job offers adequate salary and profit sharing plan. Reply Box D-563, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST
Major company has attractive position for geologist with 6 to 10 years Texas and New Mexico experience. Requires supervision of subsurface work and coordination with geophysical data. Age 31-40. Good salary with opportunity for future. Address complete summary of education and experience to Box D-613, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST with 2 or more years experience in field work and drafting, who has instrumental yen, to work with Independent Geological and Geophysical firm located in Texas. Instrumental instruction will be supplied but experience in nominal geological field work is required. State age, training and expected salary. Address Box D-619, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES ENGINEERS
OPERATIONS SUPERVISORS
PERFORATOR OPERATORS
Only Experienced Men Need Apply.
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WELEX JET SERVICES, INC.
3909 Hemphill Street, Fort Worth 9, Tex.

GEOLOGIST

Rare opportunity with major company. Must have minimum of 7 years experience Mid-Continent area including subsurface, geophysical liaison, and administrative. Age 30-45. Excellent salary and chance for advancement. Reply Box D-610, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

WANTED: Thoroughly experienced subsurface geologists for well sitting in geological field laboratory units. Please send full particulars, references, and expected salary in first letter. Box D-616, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED by Progressive Independent: A petroleum production engineer with major company Texas experience. All replies handled in strict confidence. Box D-618, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

GRADUATE GEOLOGIST, experienced, desires conneection with Independent. Box D-623, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED OIL MAN wants connection. Seven years major company petroleum engineer and production foreman. B.S. and M.S. degrees, California Institute Technology. Age 35, healthy, married, good habits, best references. Address: Engineer, 247 La Colina Drive, Bakersfield, California.

ASPHALT refinery superintendent, 22 years general refinery experience, 8 years refinery superintendent desires position with small independent oil company with possibilities of working interest in refinery. Box D-597, The Oil and Gas Journal, Tulsa, Oklahoma.

TOOLPUSHER—Cable Tools, wants connection with Independent operator or contractor. Thirty years in field; furnish good references; sober and reliable. Thoroughly experienced drilling and completion work; some production experience. Can and will go anywhere for right connection. Box D-598, The Oil and Gas Journal.

GEOLOGIST: Young, good health and character, 3 years experience with major company, desires change. Box D-612, The Oil and Gas Journal, Tulsa, Oklahoma.

MATERIALS MAN or salesman: 16 years' experience handling oilfield materials and equipment for major companies abroad and in selling on West Coast, field auditing, drilling tool maintenance. Know Spanish. Box D-615, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE GEOLOGIST, experienced home and abroad, desires position in New York City. Box D-621, The Oil and Gas Journal, Tulsa, Oklahoma.

INDUSTRIAL TRAINER or Personnel Relations Director: 15 years successful experience with major oil companies. B.A., M.A. degrees. Available on consulting or permanent basis. Box D-620, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY MACHINIST: 13 years experience in shop and maintenance of compressors, reciprocating pumps, turbines, desires position with possibilities for advancement. Age 31, Box D-596, The Oil and Gas Journal, Tulsa, Okla.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

TRAFFIC MANAGER exceptionally qualified, age 36, fourteen years experience in carrier and industrial traffic including six years petroleum refinery, College graduate, I.C.C. Practitioner, desires greater opportunity in petroleum transportation. Box D-605, The Oil and Gas Journal, Tulsa, Oklahoma.

Versatile, Educated, Experienced
SALES-ENGINEER,
PUBLIC RELATIONS and CONTACT SPECIALIST

Thoroughly familiar with all phases of oil drilling and producing. Desire position with Oil Company, Manufacturer, Specialty or Service Company, combining above qualifications. Acquainted intimately with many areas, willing to travel, but prefer Gulf Coast region as headquarters.

Write Box D-622
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

SALES-ENGINEER
NEW YORK DISTRICT OFFICE
C. F. BRAUN & CO.

We need a graduate chemical engineer with at least five years' experience in Oil Refining. To this man we offer a responsible, interesting, and rewarding position as a member of our New York Office Staff. The work entails some travel. The compensation is straight salary and expenses. And the future is limited only by the man's own ability to produce.

The man we need has technical ability, plus a good personality. On the technical side, our man has a thorough knowledge of heat-transfer, fractionation, and of refinery process-design. This knowledge must be based on actual experience. On the personal side, he is between 28 and 35 years old. He is aggressive. He's friendly, and likes to meet new people. And he is sincerely interested in a permanent career in sales engineering with one of the top Companies in its field.

If you believe you're fully qualified, please write to us at 630 Fifth Avenue, New York 20, New York. We'll acknowledge your letter, and interview all qualified men. We'll respect your confidence. Please do not phone, or call in person. No such applications will be considered.

SITUATIONS WANTED

GEOLOGIST, aged 35, 6 years' experience subsurface work with major company, desires position with aggressive independent. Box D-617, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED

WANTED: SURPLUS Chemicals, Oils, Waxes, Solvents, Wastes and Residues of all kinds. Chemical Service Corporation, 98-06 Beaver St., New York 5, N. Y.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorney, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

LEASE AND DRILLING BLOCKS

OFFER for immediate sale all or any part 15,000 acres, new ten year leases, Roosevelt County, New Mexico, located in and adjoining major companies purchases since Magnolia Chaves County discovery completed 6-1-50—over 475,000 acres were recorded. Write or wire Clyde Kelly, 416 Hales Bldg., Oklahoma City, for list and prices. Phone 7-4589.

SCURRY COUNTY: Have leased two lots 50 x 140 north outskirts Snyder. Want bonus, drilling agreement and override. V. A. Epps, Pioneer Hotel, Tucson, Arizona.

WANTED: Producing properties, proven leases and leases near production. Prompt attention given to offerings. B. F. Gudwin & Co., Licensed Brokers, 220 Broadway, New York 7, N. Y.

13 WELLS, 110 acre lease shallow producing from 700' Berea, near Ashland, O. Many good locations, low cost terms. E. N. Rehler, Allegany, N. Y.

MISSISSIPPI
North-Central GUSHERS. North-eastern shallow. Will block your favorite spot 5,000 to 10,000 acres. 25 wells drilling this year. Bank references and quick action. Leases your bank with draft attached. Blocking, buying, drilling Arkansas, Louisiana, Tennessee, Kentucky. Gilt-edge organization. OIL, 1369 Court, Memphis, Tenn.

SASKATCHEWAN LEASES

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Bought and Sold—Any Area
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Patent #129
Block 4/1040
Three Miles North of University Land

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Write for further information and state any reasonable proposition to:

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Grand Central Station, New York, N. Y.

ROYALTIES

1400 ACRES, ¼ royalty oil and gas, Southern Le Flore County, cheap. Z. J. Harrison, Poteau, Oklahoma.

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ELK CITY POOL—(Oklahoma)
Royalties at bargain. A. S. Berry, owner, 522 Wright Building, Tulsa, Oklahoma. Phone 5-5402. Investors with capital solicited for purchases in pool and trend.

WANTED
PRODUCING ROYALTIES
BOX 591, HOUSTON, TEXAS

MONTANA ROYALTIES
Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa, 3, Oklahoma

PRODUCTION FOR SALE

FOR SALE: 40 bbls. sand production, 2 wells, and five undrilled locations near Tulsa. 40 gravity oil, new equipment. Price $35,000.00 for quick sale. P. O. Box 26, Tulsa, Oklahoma.

MANUFACTURERS REPRESENTATIVE

WANTED: Manufacturers' representative for established line of oil well pumping equipment and specialties for the states of Colorado, Wyoming, Montana, and Western Canada. Give experience and list of present manufacturers represented. Write Box D-579, The Oil and Gas Journal, Tulsa, Oklahoma.

UNUSUAL Opportunity: For Sale, Complete Theatre Circuit of 9 Suburban Theatres in best Port City in the South, Complete organization, to step in, most efficiently staffed, Several New De Lux Houses, all property clear, will take 100,000.00 dollars to handle, balance in 20 years, with 20 year lease, at low rate. Will stand most rigid investigation. Box D-608, The Oil and Gas Journal, Tulsa, Oklahoma.

REAL ESTATE

DO YOUR WANT TO RETIRE TO THE DELIGHTFUL OZARKS?

For sale by owner, good six room home on 185 foot by 190 foot tract. Natural gas. Fine water. All city convenience. Garden, small fruits, wonderful shade trees. Mild climate. Write P. O. Box 385, Rogers, Arkansas.

Western Kentucky

(Continued from page 107)

Jackson 895-931 ft., TD 1,031 ft. Extension Adaburg pool.)

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: National Associated Petroleum Co. 1 Bowles, E½ NW SE SW 2-P-32, dry, TD 1,625 ft.

Hancock County: Skiles Oil Corp. 1 Downs, S½ NE SW SW 25-P-34, dry, TD 940 ft.

Webster County: J. Frank Hinkle 1 Robert, SW SW NE NE 3-L-23, dry, TD 2,685 ft.

EASTERN KENTUCKY

ASHLAND.—In Big Sandy gas field, the only actively exploited gas area in eastern Kentucky at the present time, Kentucky West Virginia Gas Co. completed the following wells: 5938 G. W. Tackett, Pike County sector, 3,384,000 cu. ft. of gas daily from Big Lime (Mississippian) at 2,214 ft. total depth; 5942 Austin Vance, Knott County sector, 2,071,000 cu. ft. of gas daily from Big Lime at 2,390 ft. total depth; 5931 Eli Johnson, Floyd County sector, 582,000 cu. ft. gas daily from Devonian black shale at 3,950 ft. total depth.

In northeastern Estill County and on the east end of the Furnace (Deep) gas pool, 25-P-69, Jack Kindred et al are shut down for orders after drilling deeper to 2,705 ft. total depth, and not recording any increase in oil or gas. Previously indications were that this would be the first St. Peter oil accumulation in eastern Kentucky but testing many days at 2,690 ft. in the sand resulted in only a small amount of oil daily with some water. Operators, on the strength of this test, may drill another in the immediate area.

EQUIPMENT MEN

(Continued from page 115)

L. O. Morris Joins Tube Turns at Tulsa Office

Landis O. Morris, Jr., has been assigned to the staff of Robert S. Tyler, Jr., manager of the Tulsa office of Tube Turns, Inc. He attended Centre College and joined Tube Turns, Inc., in July 1949.

Casey Named Manager Gas Turbine Sales

John R. Casey has been appointed manager of the newly established gas-turbine sales division of General Electric apparatus department's turbine divisions, with headquarters in Schenectady, according to C. S. Coggeshall, manager of sales of the divisions. Casey has been a turbine specialist in the company's Philadelphia office.

Casey graduated from Worcester Polytechnic Institute in 1937 with a B. S. degree in mechanical engineering. Immediately following graduation he joined G. E. on the test course in Schenectady.

After 3 years of test experience, he was assigned to the commercial engineering division of the turbine divisions, and in 1941 was transferred to the Philadelphia office of the apparatus department as a turbine specialist.

J. F. Wallace Joins Watts, Payne Agency in Dallas

John F. Wallace, formerly vice president, Brennan Advertising Agency, Houston, has been appointed to head the industrial advertising division of the Dallas office of Watts, Payne Advertising, Inc.

In his new post, Wallace will specialize in trade-paper, direct-mail, and other types of advertising and sales promotion for manufacturers of industrial equipment and supplies.

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CALENDAR

August

Interstate Oil Compact Commission, summer meeting, French Lick, Ind., August 3-5.

September

Tri-State Oil Show, Grayville, Ill., September 2-4.

National Chemical Exposition, Chicago Coliseum, Chicago, September 5-9.

American Association of Petroleum Geologists Regional Meeting, Banff Springs Hotel, Alberta, Canada, September 5-8.

American Institute of Chemical Engineers, regional meeting, Minneapolis, September 10-13.

American Society of Mechanical Engineers, and Instrument Society of America, Municipal Auditorium, Buffalo, N. Y., September 11-15.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 13-15.

National Association of Corrosion Engineers, Shreveport section, school meeting, Caddo Hotel, Shreveport, September 13-15.

Instrument Society of America, annual instrument conference and exhibit, Municipal Auditorium, Buffalo, N. Y., September 18-22.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 24-28.

October

American Gas Association, annual convention, Atlantic City, N. J., October 2-6

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, Mid-Continent meeting, Roosevelt Hotel, New Orleans, October 4-6.

American Association of Oilwell Drilling Contractors, annual meeting, Mayo Hotel, Tulsa, October 9-10.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, West Coast meeting, Elks Club, Los Angeles, October 12-13.

Permian Basin Oil Show, Odessa, Tex., October 19-22.

Independent Natural Gas Association of America, annual meeting, Shamrock Hotel, Houston, October 23.

November

Mid-Continent Oil and Gas Association, Louisiana-Arkansas Division, annual meeting, Roosevelt Hotel, New Orleans, November 2-3.

California Natural Gas Association, Silver Anniversary, Los Angeles, November 9-10.

American Petroleum Institute, annual meeting, Biltmore and Ambassador Hotels, Los Angeles, November 13-16.

American Society of Mechanical Engineers, Hotel Statler, New York, November 26-December 1.

December

American Institute of Chemical Engineers, annual meeting, Columbus, Ohio, December 3-6.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Ole College Inn Houston.

Los Angeles Nomads, second Wednesday of each month. Jonathan Club.

Permian Basin

(Continued from page 106)

elev. 3,540 ft., San Andres 4,740 ft., Glorietta 6,240 ft.

Garza County: George P. Livermore, Inc. 1 Doyle Justice, NE NE SE 3-6-H&GN, 4 mi. SE Justiceburg, 1 mi. SW Justiceburg field, dry, TD 2,665 ft., elev. 2,302 ft., lime 1,560 ft.

Hockley County: Kewanee Oil Co. 1 C. T. Pace, approximately SW SW Labor 13, League 33, Baylor CSL, A-5, 3½ mi. E Levelland field, dry, TD 5,269 ft., elev. 3,496 ft., San Andres 4,290 ft.

Kent County: L. H. Armer, G. H. Chizum and Castleman & O'Neill 1 Girard Trust, SW SW 109-1-H&GN, 2 mi. S Dickens County line in NW corner of county, dry, TD 7,707 ft. in dolomite, elev. 2,188 ft., Strawn around 7,008 ft.

King County: Ard Drilling Co. 1 R. B. Masterson "B," NW NW 167-A-R. M. Thompson Sur., 1 mi. S J-Y field, 15 mi. NE Guthrie, dry, TD 5,635 ft., elev. (?), Canyon reef 4,578 ft.

Lynn County: James H. Snowden 1 Bryan Williams, NE SE 1407-1-ELRR, 2¼ mi. SW PHD field, dry, TD 9,226 ft., elev. 2,954 ft., Yates 1,925 ft., San Andres 3,035 ft., Spraberry 5,408 ft., Dean 6,955 ft., reef 8,521 ft., Mississippian 8,865 ft., Ellenburger 9,186 ft.

McCulloch County: Emory A. Dunham 1 L. E. Smith, 250-60-J. W. Black Sur., A-1960, 2¼ mi. NE Placid, dry, TD 760 ft.

Reeves County: Morris & Scherck 1 Hoefs, NE NE 58-13-H&GN, dry, TD 5,378 ft., elev. (?), Delaware sand 5,360 ft.

Runnels County: O. W. Killam 1 J. R. Harris, Carter Anderson Sur. 523, 3 mi. S Winters, dry, TD 4,703 ft., elev. 1,739 ft., base Coleman Junction 1,520 ft.

Joe G. Strahan and P. M. Barton 1 W. S. Proctor, Sec. 3, H&GN Sur., 7½ mi. SW Winters, dry, TD 5,240 ft., elev. 1,924 ft., base Coleman Junction 2,080 ft., Camp Colorado 2,400 ft., Saddle Creek 2,650 ft., Breckenridge 2,930 ft., Home Creek 3,650 ft., Travis sand 3,190 ft., Palo Pinto 4,095 ft., Capps 4,345 ft.

G. W. Strake 1 G. W. Bailey, J. Hensley Sur. 83, 4 mi. NW Winters, dry, TD 4,467 ft. in salt water.

Schleicher County: E. H. Wahlenmaier and Morgan-Aikman Co. 1 J. F. Webster, NW NW 5-8-TW&NG, 14 mi. E Page field, dry, TD 5,206 ft., elev. 2,334 ft., Palo Pinto 3,760 ft., Strawn 4,396 ft., Ellenburger 4,775 ft.

Scurry County: Coronado Oil Co. 1 M. A. Shannon, NE NE 377-97-H&TC, 1¼ mi. SW Dermott, dry, TD 7,515 ft., elev. 2,571 ft., top lime 7,270 ft.

TEXAS PANHANDLE (DISTRICT 10)

Randall County: Holifield-Nortex 1 J. J. Currie, Jr., NW NW 7-6-I&GN Sur., 12 mi. NE Canyon, dry, TD 5,017 ft. in Permian, elv. 3,544 ft., dolomite 4,660 ft., DST 4,793-4,823 ft. recovered mud.

SOUTHEASTERN NEW MEXICO

HOBBS.—Amerada Petroleum Corp. 1-RA State, 22-8s-32e, Chaves County, was drilling at 8,660 ft. following a drill-stem test. From 8,550-8,660 ft., open 1 hour and 40 minutes, the well made a slight blow for 20 minutes and died. Recovery was drilling mud with no shows. Projected depth was 11,750 ft. Top of the Pennsylvanian was called at 8,420 ft., on elevation of 4,373 ft.

Union Oil Co. of California 1 State-Fairbairn, 24-14s-31e, Chaves County, had total depth at 11,200 ft. in lime and shale and was running electrical surveys.

Northeast of the Saunders field, Lea County, Amerada 1-SA State, 35-14s-33e, was drilling lime and shale at 7,310 ft. On elevation of 4,194 ft., top of the Yeso section was 5,760 ft.

Three miles southwest of the Saunders discovery, Gulf Oil Corp. 1 Sams-State, 17-15s-33e, was drilling below 12,053 ft. in limestone. Formation tops have not been reported below the Permo-Pennsylvanian transition zone around 9,225 ft.

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XUM

XUM

Isn't this a pretty kettle of fish?

SURVEYS reveal an appalling misunderstanding among young people of the "facts of business life." For example, a poll was made among seniors in certain high schools which showed that they believe business profits are "over 50%" of the sales dollar, where actually profits average less than 8%. These students also think that stockholders receive 24% of the sales dollar, where actually it runs less than 3%.

Isn't this a pretty kettle of fish?

A greater part of the 8% of the sales dollar is reinvested in the business to expand and improve plant facilities which protects employment and creates new jobs for more workers.

Such ignorance is alarming. It is unfair to the young people themselves and dangerous to America's future. Such misconceptions open the door to socialism, communism and all the fantasies of the handout or "something-for-nothing" state of the economic dreamers.

Our school teachers say they *want* authentic information on the business system and how it works. Only business itself can supply the facts. You as a business leader in your community must share the responsibility for this misunderstanding. It is our civic duty to help overcome this misconception of everyday economics in the minds of our youth today.

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

XUM

Here's why HUGHES OSC series bits get more hole quicker in soft formations

The Hughes OSC rock-bit series is particularly designed for formations of low compressive strength in which soft, plastic, adhesive materials are frequently encountered. Such materials cannot be removed efficiently by chipping alone. You need a tooth action that will penetrate, move the formation and tear it loose.

This tooth action can be demonstrated with a knife and modeling clay. If you stick a knife blade into the clay, and then pull it out, you don't remove any material. The best way to remove a piece of the clay is to push the blade in, twist and scoop out. This is the principle on which the Hughes OSC series of rock bits is designed.

The twisting, tearing action of the long, coarse-pitched teeth enables the bit to scoop the formation in this manner without balling up. The intermeshing feature of the Hughes Tri-Cone bit, plus the scientifically directed jetting action, assures the most efficient cleaning. That's why, on rig after rig, you'll find Hughes OSC series bits in the hole!

HUGHES

TOOL COMPANY

HOUSTON, TEXAS

HUGHES OSC SERIES TRI-CONE® ROCK BITS

World Standard of the Industry